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SEARCH REQUEST FORM

Scientific and Technical Inf rmation Center

Requester's Full Name: Raymond Alejandro Examiner #: 76895 Date: 11/20/02
Art Unit: 1745 Phone Number 306-3326 Serial Number: 09/750402
Mail Box and Bldg/Room Location: CPlaza 3, 8E02 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Composite solid polymer electrolyte membrane

Inventors (please provide full names): Formato et al

Earliest Priority Filing Date: 12/28/00 US 2002045085

****For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.***

Please, refer to claims 51-76, 118-119 and 121-123 for specific subject matter to be searched.

****

STAFF USE ONLY	**Type of Search**	**Vendors and cost where applicable**
Searcher: K. Fuller	NA Sequence (#)	STN ✓
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#) ✓	Questel/Orbit
Date Searcher Picked Up:	Bibliographic ✓	Dr.Link
Date Completed: 12/10/02	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 60	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 70	Other	Other (specify)

PTO-1590 (8-01)

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Kathleen Fuller 308-4290 Eric Linnell 308-4143 John Calve 308-4139

All searchers are located in the library in CP3/4 3D62

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=> FILE HCAPLUS
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FILE COVERS 1907 - 10 Dec 2002  VOL 137 ISS 24
FILE LAST UPDATED: 9 Dec 2002  (20021209/ED)
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This file contains CAS Registry Numbers for easy and accurate substance identification.

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L7           785 SEA FILE=HCAPLUS ABB=ON  SPEM OR SPEMS OR COMPOSIT?(2A)POLYMER?
                 (2A)ELECTROL?
L8          1705 SEA FILE=HCAPLUS ABB=ON  POLYMER?(2A)ELECTROL?(2A)MEMBRAN?
L9         22678 SEA FILE=HCAPLUS ABB=ON  LIQ?(2A)CRYST?(2A)?POLYMER?
L12          505 SEA FILE=HCAPLUS ABB=ON  (L7 OR L8 OR L9) AND ION?(3A)?CONDUCT?

L13            2 SEA FILE=HCAPLUS ABB=ON  L12 AND INTERPENETRAT?
L14          383 SEA FILE=HCAPLUS ABB=ON  (L7 OR L8 OR L9) AND PERFLUOR?
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L16           47 SEA FILE=HCAPLUS ABB=ON  (L12 OR L14) AND (CAST? OR EXTRU?)
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L18           20 SEA FILE=HCAPLUS ABB=ON  L16 AND COMPOSITE#
L19           33 SEA FILE=HCAPLUS ABB=ON  L13 OR L15 OR L17 OR L18
L21       945940 SEA FILE=REGISTRY ABB=ON  PMS/CI
L24       469219 SEA FILE=REGISTRY ABB=ON  L21 AND  46.150.18/RID
L25       438819 SEA FILE=REGISTRY ABB=ON  L24 NOT 1-20/SI
L26       438819 SEA FILE=REGISTRY ABB=ON  L25 OR L25
L27       218820 SEA FILE=REGISTRY RAN=(,134196-84-2) ABB=ON  L25 OR L25
L28       219999 SEA FILE=REGISTRY ABB=ON  L26 NOT L27
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L33           35 SEA FILE=HCAPLUS ABB=ON  L31 AND SOLID?
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L41            7 SEA FILE=HCAPLUS ABB=ON  L39 AND SOLID?(4A)MEMBRANE?
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L46           22 SEA FILE=HCAPLUS ABB=ON  L19 AND PLASTICS FABRI?/SC,SX
L47           19 SEA FILE=HCAPLUS ABB=ON  L33 AND PLASTICS FABRI?/SC,SX
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L48          44 SEA FILE=HCAPLUS ABB=ON  L34 OR L32 OR L47 OR L46 OR L41 OR
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FILE LAST UPDATED:            9 DEC 2002      <20021209/UP>
MOST RECENT DERWENT UPDATE:      200279        <200279/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> SLART (Simultaneous Left and Right Truncation) is now
    available in the /ABEX field. An additional search field
    /BIX is also provided which comprises both /BI and /ABEX <<<

>>> PATENT IMAGES AVAILABLE FOR PRINT AND DISPLAY <<<

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L7          785 SEA FILE=HCAPLUS ABB=ON  SPEM OR SPEMS OR COMPOSIT?(2A)POLYMER?
                (2A)ELECTROL?
L8         1705 SEA FILE=HCAPLUS ABB=ON  POLYMER?(2A)ELECTROL?(2A)MEMBRAN?
L9        22678 SEA FILE=HCAPLUS ABB=ON  LIQ?(2A)CRYST?(2A)?POLYMER?
L49         177 SEA FILE=WPIX ABB=ON  (L7 OR L8 OR L9) AND ION?(3A)?CONDUCT?
L51           3 SEA FILE=WPIX ABB=ON  L49 AND INTERPENETRAT?
L52          21 SEA FILE=WPIX ABB=ON  L49 AND (CAST? OR EXTRU?)
L53          10 SEA FILE=WPIX ABB=ON  L52 AND (COMPOSITE# OR SUBSTRATE?)
L54          11 SEA FILE=WPIX ABB=ON  L51 OR L53


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FILE LAST UPDATED: 26 NOV 2002      <20021126/UP>
FILE COVERS 1972 TO DATE

>>> The RAPRA Classification Code is available as a PDF file
>>> and may be downloaded free-of-charge from:
>>> http://www.stn-international.de/stndatabases/details/rapra_classcodes.pdf

=> D QUE L60
L7          785 SEA FILE=HCAPLUS ABB=ON  SPEM OR SPEMS OR COMPOSIT?(2A)POLYMER?
                (2A)ELECTROL?
L8         1705 SEA FILE=HCAPLUS ABB=ON  POLYMER?(2A)ELECTROL?(2A)MEMBRAN?
L9        22678 SEA FILE=HCAPLUS ABB=ON  LIQ?(2A)CRYST?(2A)?POLYMER?
L55          46 SEA FILE=RAPRA ABB=ON  (L7 OR L8 OR L9) AND ION?(3A)?CONDUCT?
L57           2 SEA FILE=RAPRA ABB=ON  L55 AND (CAST? OR EXTRU?)
L58          17 SEA FILE=RAPRA ABB=ON  L55 AND (COMPOSITE# OR SUBSTRATE?)
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L59            4 SEA FILE=RAPRA ABB=ON  L58 AND SOLID?
L60            5 SEA FILE=RAPRA ABB=ON  L57 OR L59
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=> FILE JAPIO
FILE 'JAPIO' ENTERED AT 15:41:55 ON 10 DEC 2002
COPYRIGHT (C) 2002 Japanese Patent Office (JPO)- JAPIO

FILE LAST UPDATED: 22 NOV 2002        <20021122/UP>
FILE COVERS APR 1973 TO JUNE 28, 2002

>>> JAPIO has been reloaded on August 25 and saved answer sets
    will no longer be valid.  SEE HELP RLO for details  <<<


=> D QUE L61
L7           785 SEA FILE=HCAPLUS ABB=ON  SPEM OR SPEMS OR COMPOSIT?(2A)POLYMER?
                 (2A)ELECTROL?
L8          1705 SEA FILE=HCAPLUS ABB=ON  POLYMER?(2A)ELECTROL?(2A)MEMBRAN?
L9         22678 SEA FILE=HCAPLUS ABB=ON  LIQ?(2A)CRYST?(2A)?POLYMER?
L55           46 SEA FILE=RAPRA ABB=ON  (L7 OR L8 OR L9) AND ION?(3A)?CONDUCT?
L57            2 SEA FILE=RAPRA ABB=ON  L55 AND (CAST? OR EXTRU?)
L58           17 SEA FILE=RAPRA ABB=ON  L55 AND (COMPOSITE# OR SUBSTRATE?)
L59            4 SEA FILE=RAPRA ABB=ON  L58 AND SOLID?
L61           10 SEA FILE=JAPIO ABB=ON  L57 OR L59


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TERM (/CT) THESAURUS RELOAD.

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L7           785 SEA FILE=HCAPLUS ABB=ON  SPEM OR SPEMS OR COMPOSIT?(2A)POLYMER?
                 (2A)ELECTROL?
L8          1705 SEA FILE=HCAPLUS ABB=ON  POLYMER?(2A)ELECTROL?(2A)MEMBRAN?
L9         22678 SEA FILE=HCAPLUS ABB=ON  LIQ?(2A)CRYST?(2A)?POLYMER?
L55           46 SEA FILE=RAPRA ABB=ON  (L7 OR L8 OR L9) AND ION?(3A)?CONDUCT?
L57            2 SEA FILE=RAPRA ABB=ON  L55 AND (CAST? OR EXTRU?)
L58           17 SEA FILE=RAPRA ABB=ON  L55 AND (COMPOSITE# OR SUBSTRATE?)
L59            4 SEA FILE=RAPRA ABB=ON  L58 AND SOLID?
L62           14 SEA FILE=JICST-EPLUS ABB=ON  L57 OR L59


=> DUP REM L48 L54 L60 L61 L62
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FILE 'JICST-EPLUS' ENTERED AT 15:42:32 ON 10 DEC 2002

PROCESSING COMPLETED FOR L48
PROCESSING COMPLETED FOR L54
PROCESSING COMPLETED FOR L60
PROCESSING COMPLETED FOR L61
PROCESSING COMPLETED FOR L62
L63 82 DUP REM L48 L54 L60 L61 L62 (2 DUPLICATES REMOVED)

=> D L63 1-82 ALL HITSTR

L63 ANSWER 1 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:518158 HCAPLUS
DN 137:96258
TI **Electrolytic compositions, polymer solid**/gel **electrolytes**, and lithium polymer electric batteries
IN Sato, Takaya; Masuda, Akira
PA Nisshin Spinning Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 26 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
ICS C08F002-44; C08F299-06; C08G018-67; C08K005-098; C08K005-42; C08L075-04; C08L101-00; H01B001-06; H01B001-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**, 39, 72
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002198093	A2	20020712	JP 2000-394442	20001226

OS MARPAT 137:96258
AB The title electrolyte compns. comprise (1) a matrix polymer and (2) R1(A)m(Y)nX-Li+ [R1 = C1-4 (F-substd.)alkyl, (F-substd.)alkoxy; A = perfluoroalkylene, polyoxyalkylene, polyfluoroxyalkylene; Y = CH2, CF2; X = SO3, SO2NSO2R4, CO2; m = 1-70; n = 0-2] and/or (3) Li+X-(Y1)e(A)p(Y2)fX-Li+ [Y1 = CH2, CF2; Y2 = OCH2, OCF2; e, f = 0-2; p = 0-70]. The Li-cation/polymer-anion compns. give the Li secondary batteries high **ion cond.** or transport and prevention of electrolyte thermal decompn.
ST lithium cation cond transport polymer plastic anion electrolyte battery
IT Secondary batteries
(electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)
IT Electric **conductivity**
(**ion cond.**; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)
IT Electrolytes
(lithium/polymer plastic anion, **solid** or gel; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)
IT Cations
(lithium; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)
IT Thermal decomposition
(of electrolyte, prevention of; electrolytic compns., polymer

solid/gel electrolytes, and lithium polymer elec. batteries)

IT Polyoxyalkylenes, preparation
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(perfluoro, carboxy-terminated, lithium salts; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)

IT Anions
(plastic polymer; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)

IT Fluoropolymers, preparation
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(polyoxyalkylene-, carboxy-terminated, lithium salts; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)

IT 7439-93-2P, Lithium, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
(cation, in secondary batteries; electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)

IT 37291-33-1P 84743-32-8P 442201-74-3P 442201-75-4P 442201-76-5P 442201-77-6P **442201-78-7P** **442201-79-8P** **442201-80-1P** **442514-70-7P**
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)

IT 7440-44-0, MCMB6-28, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(neg. active material; electrolytic compns., polymer **solid** /gel electrolytes, and lithium polymer elec. batteries)

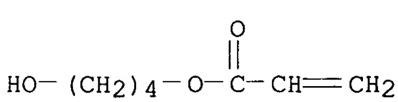
IT 7791-03-9, Lithium perchlorate (LiClO4) 12190-79-3, Cobalt lithium oxide (CoLiO2) 14283-07-9 21324-40-3, Lithium hexafluorophosphate (LiPF6)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(pos. active material; electrolytic compns., polymer **solid** /gel electrolytes, and lithium polymer elec. batteries)

IT **442201-78-7P** **442201-79-8P** **442201-80-1P** **442514-70-7P**
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(electrolytic compns., polymer **solid**/gel electrolytes, and lithium polymer elec. batteries)

RN 442201-78-7 HCAPLUS
CN 2-Propenoic acid, 4-hydroxybutyl ester, polymer with 2-hydroxyethyl 2-propenoate, 1,1'-methylenebis[4-isocyanatobenzene], methyloxirane and oxirane (9CI) (CA INDEX NAME)

CM 1

CRN 2478-10-6
CMF C7 H12 O3



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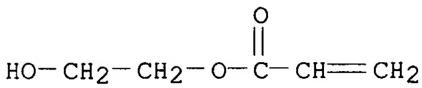
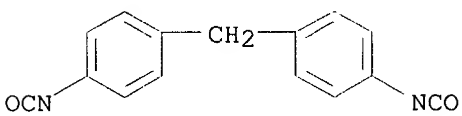
CRN 818-61-1
CMF C5 H8 O3



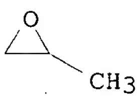
CM 3

CRN 101-68-8
CMF C15 H10 N2 O2



CM 4

CRN 75-56-9
CMF C3 H6 O



CM 5

CRN 75-21-8
CMF C2 H4 O

RN 442201-79-8 HCAPLUS
CN 1,4-Butanediol, polymer with 1,1'-methylenebis[4-isocyanatobenzene] and Placcel 220N (9CI) (CA INDEX NAME)

CM 1

CRN 110120-47-3
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

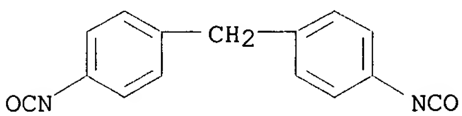
CM 2

CRN 110-63-4
CMF C4 H10 O2

HO— $(CH_2)_4$ — OH

CM 3

CRN 101-68-8
CMF C15 H10 N2 O2



RN 442201-80-1 HCAPLUS
CN 1,4-Butanediol, polymer with 1,1'-methylenebis[4-isocyanatobenzene], .alpha.-(2-methyl-1-oxo-2-propenyl)-.omega.-methoxypoly(oxy-1,2-ethanediyl) and Placcel 220N (9CI) (CA INDEX NAME)

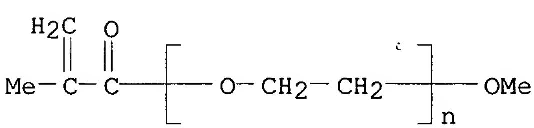
CM 1

CRN 110120-47-3
CMF Unspecified
CCI PMS, MAN

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 26915-72-0
CMF (C2 H4 O)n C5 H8 O2
CCI PMS



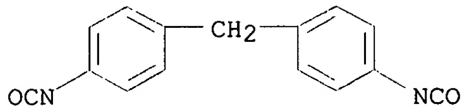
CM 3

CRN 110-63-4
CMF C4 H10 O2

HO— $(CH_2)_4$ — OH

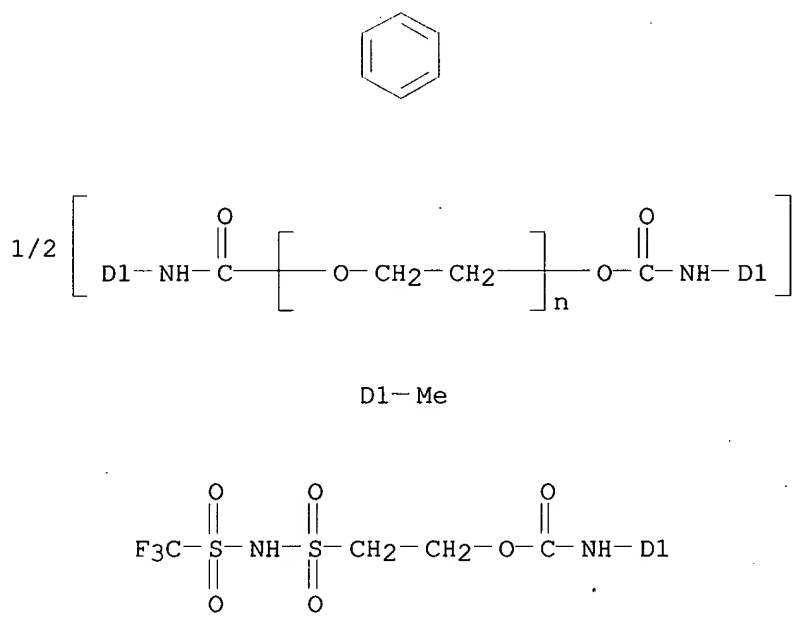
CM 4

CRN 101-68-8
CMF C15 H10 N2 O2

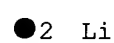


RN 442514-70-7 HCAPLUS
CN Poly(oxy-1,2-ethanediyl), .alpha.-[[[methyl[(8,8,8-trifluoro-5,5,7,7-tetraoxido-1-oxo-2-oxa-5,7-dithia-6-azaoct-1-yl)amino]phenyl]amino]carbonyl]-.omega.-[[[[methyl[(8,8,8-trifluoro-5,5,7,7-tetraoxido-1-oxo-2-oxa-5,7-dithia-6-azaoct-1-yl)amino]phenyl]amino]carbonyl]oxy]-, dilithium salt (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



L63 ANSWER 2 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:268614 HCAPLUS
DN 136:297388
TI Proton-conducting polyimide resin composition, its **membrane**, and **polymer-electrolyte** fuel cell
IN Kuromatsu, Hidehisa; Nagano, Kosaku
PA Kanegafuchi Chemical Industry Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C08G073-10

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     ICS  H01M008-02; H01M008-10
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 38
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
PI   JP 2002105199     A2    20020410      JP 2000-300910   20000929
AB   The compn. contains a polyimide resin having a repeating unit obtained by
     polycondensation of a multifunctional component contg. .gtoreq.3 amino
     groups and tetracarboxylic acid dianhydride, which comprises a
     proton-conducting substituent.  The claimed membrane comprises the above
     compn.  The claimed fuel cell is equipped with the above membrane.  The
     compn. has high proton cond.
ST   proton conducting polyimide compn membrane
     polymer electrolyte fuel cell
IT   Ionic conductors
        (polymeric; proton-conducting polyimide resin compn. for
        membrane in polymer-electrolyte fuel cell)
IT   Fuel cell electrolytes
       Solid state fuel cells
        (proton-conducting polyimide resin compn. for membrane in
        polymer-electrolyte fuel cell)
IT   Polyimides, uses
     RL: DEV (Device component use); IMF (Industrial manufacture); PREP
     (Preparation); USES (Uses)
        (proton-conducting polyimide resin compn. for membrane in
        polymer-electrolyte fuel cell)
IT   406940-51-0P
     RL: DEV (Device component use); IMF (Industrial manufacture); PREP
     (Preparation); USES (Uses)
        (proton-conducting polyimide resin compn. for membrane in
        polymer-electrolyte fuel cell)
IT   406940-51-0P
     RL: DEV (Device component use); IMF (Industrial manufacture); PREP
     (Preparation); USES (Uses)
        (proton-conducting polyimide resin compn. for membrane in
        polymer-electrolyte fuel cell)
RN   406940-51-0  HCAPLUS
CN   [1,1'-Biphenyl]-2,2'-disulfonic acid, 4,4'-diamino-, polymer with
     [2]benzopyrano[6,5,4-def][2]benzopyran-1,3,6,8-tetrone,
     [1,1'-biphenyl]-3,3',4,4'-tetramine and 4,4'-(9H-fluoren-9-
     ylidene)bis[benzenamine] (9CI)  (CA INDEX NAME)

     CM   1

     CRN  15499-84-0
     CMF  C25 H20 N2
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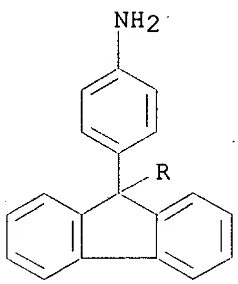
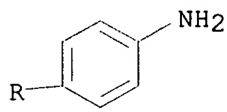
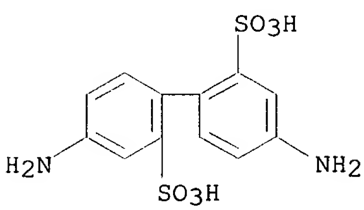




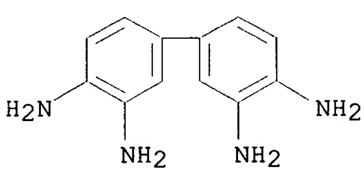
CM 2

CRN 117-61-3
CMF C12 H12 N2 O6 S2



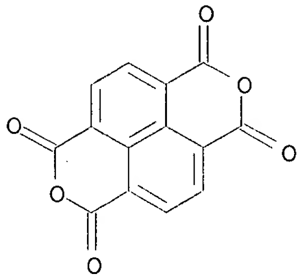
CM 3

CRN 91-95-2
CMF C12 H14 N4



CM 4

CRN 81-30-1
CMF C14 H4 O6



L63 ANSWER 3 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:69605 HCAPLUS
DN 136:121079
TI Polymer electrolyte fuel cells and their manufacture
IN Takebe, Yasuo; Hosaka, Masato; Gyoten, Hisaaki; Uchida, Makoto; Shinkura, Junji; Hato, Kazuhito; Kanbara, Teruhisa
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M004-96
ICS H01M004-88; H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**, 67
FAN.CNT 1

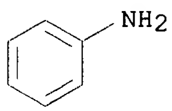
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002025564	A2	20020125	JP 2000-204718	20000706

AB The fuel cells contain **polymer electrolyte membranes** sandwiched between a pair of electrodes having catalyst layers contg. C-supported catalysts, polymer electrolytes, and elec. conductive polymers prepd. by polymn. of monomers selected from pyrrole, thiophene, aniline, dihalogenated benzene, dihalogenated thiophene, and dihalogenated pyridine. The manufg. process includes chem. or electrolytic polymn. of the monomers in the catalyst mixts. and application of the mixts. on porous electrodes to form the catalyst layers. Th C-supported catalysts are coated with the elec. conductive polymers to achieve high catalytic efficiency and high performance of the fuel cells.
ST conducting polymer electrolyte fuel cell catalyst; carbon catalyst polymer electrolyte fuel cell
IT Catalysts
(electrocatalysts; polymer electrolyte fuel cells having C-supported catalyst layers contg. elec. conductive polymers)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-contg., ionomers, Nafion; polymer electrolyte fuel cells having C-supported catalyst layers contg. elec. conductive polymers)
IT **Conducting** polymers
(**ionic**; polymer electrolyte fuel cells having C-supported catalyst layers contg. elec. conductive polymers)
IT Catalyst supports
Fuel cell electrodes
Fuel cell electrolytes

Polymer electrolytes
  Solid state fuel cells
    (polymer electrolyte fuel cells having C-supported catalyst layers
    contg. elec. conductive polymers)
IT Polyanilines
  RL: DEV (Device component use); IMF (Industrial manufacture); PREP
  (Preparation); USES (Uses)
    (polymer electrolyte fuel cells having C-supported catalyst layers
    contg. elec. conductive polymers)
IT **Ionic conductors**
    (polymeric; polymer electrolyte fuel cells having C-supported catalyst
    layers contg. elec. conductive polymers)
IT Fluoropolymers, uses
  RL: DEV (Device component use); USES (Uses)
    (polyoxyalkylene-, sulfo-contg., ionomers, Nafion; polymer electrolyte
    fuel cells having C-supported catalyst layers contg. elec. conductive
    polymers)
IT Ionomers
  RL: DEV (Device component use); USES (Uses)
    (polyoxyalkylenes, fluorine- and sulfo-contg., Nafion; polymer
    electrolyte fuel cells having C-supported catalyst layers contg. elec.
    conductive polymers)
IT 7440-44-0, Carbon, uses
  RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
    (catalyst support; polymer electrolyte fuel cells having C-supported
    catalyst layers contg. elec. conductive polymers)
IT 7440-06-4, Platinum, uses 390761-63-4, TEC 10E50E
  RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
    (catalyst; polymer electrolyte fuel cells having C-supported catalyst
    layers contg. elec. conductive polymers)
IT 291280-30-3, TGP-H 120
  RL: DEV (Device component use); USES (Uses)
    (electrode; polymer electrolyte fuel cells having C-supported catalyst
    layers contg. elec. conductive polymers)
IT 163294-14-2, Nafion 112
  RL: DEV (Device component use); USES (Uses)
    (polymer electrolyte fuel cells having C-supported catalyst layers
    contg. elec. conductive polymers)
IT **25233-30-1P**, Polyaniline 25233-34-5P, Polythiophene
  30604-81-0P, Polypyrrole 73061-85-5P, 2,5-Dibromothiophene homopolymer
  113814-61-2P, Dibromobenzene homopolymer 183025-63-0P
  390739-10-3P **390750-16-0P**
  RL: DEV (Device component use); IMF (Industrial manufacture); PREP
  (Preparation); USES (Uses)
    (polymer electrolyte fuel cells having C-supported catalyst layers
    contg. elec. conductive polymers)
IT **25233-30-1P**, Polyaniline **113814-61-2P**, Dibromobenzene
  homopolymer **390750-16-0P**
  RL: DEV (Device component use); IMF (Industrial manufacture); PREP
  (Preparation); USES (Uses)
    (polymer electrolyte fuel cells having C-supported catalyst layers
    contg. elec. conductive polymers)
RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

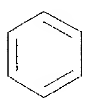
CRN 62-53-3
CMF C6 H7 N



RN 113814-61-2 HCAPLUS
CN Benzene, dibromo-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 26249-12-7
CMF C6 H4 Br2
CCI IDS

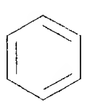


2 (D1—Br)

RN 390750-16-0 HCAPLUS
CN Benzene, diiodo-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 27496-78-2
CMF C6 H4 I2
CCI IDS



2 (D1—I)

L63 ANSWER 4 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:671689 HCAPLUS
DN 137:203963
TI Manufacture and application of polymer membranes
IN Uensal, Oemer; Kiefer, Joachim; Baurmeister, Jochen; Pawlik, Juergen; Kraus, Werner; Jordt, Frauke
PA Celanese Ventures GmbH, Germany
SO Ger. Offen., 10 pp.
CODEN: GWXXBX
DT Patent
LA German
IC ICM C08J005-22

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     ICS  C08G073-18; H01M008-02; B01D071-58
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 38
FAN.CNT 1
     PATENT NO.       KIND  DATE          APPLICATION NO.  DATE
     ---------------  ----  --------      ---------------  --------
PI   DE 10109829       A1   20020905      DE 2001-10109829 20010301
     WO 2002071518     A1   20020912      WO 2002-EP2216   20020301
         W:  BR, CA, CN, JP, KR, MX, US, ZA
         RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
             PT, SE, TR
PRAI DE 2001-10109829  A    20010301
```

AB A polyazole form the basis of this acid-doped polymer membrane. A film is **cast** using a polyazole soln. in a polar aprotic org. solvent. The film is dried to a self-supporting structure and treated with a liq. at a temp. between room temp. and the b.p. of the liq. The treatment liq. is allowed to drain off or evap. from the film and then it is doped. Due to the mech. characteristics of these membranes they have many uses and is particularly suitable as **polymer electrolyte membranes** in PEM fuel cells.

ST **polymer electrolyte membrane** protonic film conductor polyazole acid doping

IT Films
(elec. conductive; manuf. and application of polymer **membranes**)

IT Electric conductors
(films; manuf. and application of polymer **membranes**)

IT **Membranes**, nonbiological
(liq., polymer-supported; manuf. and application of polymer **membranes**)

IT Electric conductivity
Fracture energy
Fuel cell electrolytes
Polyelectrolytes
Stress-strain relationship
Tensile strength
(manuf. and application of polymer **membranes**)

IT **Ionic conductors**
(protonic; manuf. and application of polymer **membranes**)

IT 7664-38-2, Phosphoric acid, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(manuf. and application of polymer **membranes**)

IT 67-56-1, Methanol, uses 67-64-1, Acetone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(manuf. and application of polymer **membranes**)

L63 ANSWER 5 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 2002-292013 [33] WPIX
DNN N2002-227994 DNC C2002-085768
TI Multicomponent **composite** film for **polymer electrolyte** consists of support layer film and porous gellable polymer layer which are united with each other without interface between them.
DC A85 L03 X16
IN AHN, B I; AHN, S H; CHO, J Y; LEE, H M; LEE, S J; LEE, S Y; PARK, S Y; SONG, H S; AHN, B; AHN, S; CHO, J; KYUNG, Y; LEE, H; LEE, S; PARK, S; SONG, H; YONG, H
PA (GLDS) LG CHEM LTD; (GLDS) LG CHEM CO LTD
CYC 23

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PI   WO 2002015299 A1 20020221 (200233)* EN   34p    H01M002-16
        RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
         W: CN JP US
     KR 2002013634 A  20020221 (200257)              H01M002-18
ADT  WO 2002015299 A1 WO 2001-KR1374 20010811; KR 2002013634 A KR 2000-46735
     20000812
PRAI KR 2001-11191    20010305; KR 2000-46735    20000812
IC   ICM  H01M002-16; H01M002-18
```

AB WO 200215299 A UPAB: 20020524

NOVELTY - The **composite** film consists of a polymeric support layer film (11) whose one or more sides is provided with a porous gellable polymer layer (12). The support layer film and the porous gellable polymer layer are united with each other without an interface (13) between them.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(i) preparation of the multicomponent **composite** film by preparing a polymeric support layer film, dissolving a gellable polymer in a solvent for preparing a gellable polymer solution and forming a gellable polymer layer on one or more sides of the support layer film, forming the polymer layer by coating the support layer film with the polymer solution and forming multiple layers, stretching the multiple layers and subjecting to heat setting;

(ii) polymer separator;

(iii) polymer electrolyte system consisting of a porous support layer film, a multi component **composite** separator, a salt represented by A+B- and an organic solvent (A+ is at least one selected from the group consisting of alkali metallic cations including Li+, Na+, K and their derivative, and B- is at least one selected from the group consisting of PF6-, BF4-, Cl-, AsF6-, CH3CO2-, CF3SO3-, N(CH3SO2)2- and C(CH3SO2)3-); and

(iv) electrochemical device comprising the polymer electrolyte system.

USE - Used for polymer electrolyte for electrochemical devices, separators such as ultrafiltration membrane, gas separation membrane, pervaporation membrane, reverse osmosis membrane and separator for electrochemical device.

ADVANTAGE - The **composite** film has excellent electrochemical stability, adhesion to electrode, good wet-out rate of electrolyte, good **ionic conductivity** and mechanical properties. The **composite** film is prepared without extraction or removal process of plasticizer.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-section of the multicomponent **composite** film structure.

Support layer film 11
Polymer layer 12
Interface 13
Dwg.1/2

```
FS   CPI EPI
FA   AB; GI
MC   CPI: A11-B02A; A11-B02C; A11-B05D; A12-E01; L03-E01A; L03-E01C3; L03-E04G
     EPI: X16-C16; X16-F02; X16-J01A

L63  ANSWER 6 OF 82  WPIX (C) 2002 THOMSON DERWENT
AN   2002-637045 [69]    WPIX
DNN  N2002-503283        DNC C2002-179868
```

TI **Polymer electrolyte membrane** for electrolyte fuel cell, is obtained by subjecting **ion-conductive,** aromatic polymer membrane having preset water absorption to hot-water treatment.

DC A26 A85 L03 X16

IN ASANO, Y; KANAOKA, N; NANAUMI, M; SAITO, N; SOHMA, H
PA (HOND) HONDA GIKEN KOGYO KK; (HOND) HONDA MOTOR CO LTD
CYC 4

PI	CA 2368787	A1	20020719	(200269)*	EN	39p	H01M004-90
	DE 10201691	A1	20020905	(200269)			B01D071-00
	JP 2002216800	A	20020802	(200269)		7p	H01M008-02
	US 2002164513	A1	20021107	(200275)			H01M008-10

ADT CA 2368787 A1 CA 2002-2368787 20020121; DE 10201691 A1 DE 2002-10201691 20020117; JP 2002216800 A JP 2001-12490 20010119; US 2002164513 A1 US 2002-50134 20020118
PRAI JP 2001-97802 20010330; JP 2001-12490 20010119
IC ICM B01D071-00; H01M004-90; H01M008-02; H01M008-10
ICS C08J005-04; C08J005-20; C08J005-22; H01B001-06; H01M004-88; H01M010-40
ICI C08L071:00, C08L101:02
AB CA 2368787 A UPAB: 20021026

NOVELTY - A **polymer electrolyte membrane** (1) is obtained by subjecting **ion-conducting**, aromatic polymer membrane to hot-water treatment. The **ion-conducting**, aromatic polymer membrane has a maximum water absorption of 80-300 weight % based on its dry weight before hot-water treatment.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) Membrane electrode assembly which has a pair of electrodes (2,3) and **polymer electrolyte membrane** sandwiched between the electrodes;

(2) Polymer electrolyte fuel cell which is constituted by stacking several membrane electrode assemblies via separator plates (6);

(3) **Composite polymer electrolyte membrane** which comprises a matrix made of sulfonated aromatic polymer of formula (I) having high ion exchange capacity and a reinforcing material made of sulfonated aromatic polymer of formula (II) having low ion exchange capacity in the form of fibers or a porous membrane; and

(4) Production of **composite polymer electrolyte membrane** which involves **casting** by uniformly dispersing the fibrous product of sulfonated aromatic polymer of formula (II) in a solution of sulfonated aromatic polymer of formula (I).

Ar = aryl;

X = bivalent electron-attractive group selected from -CO-, -CONH-, -(CF2)p-, -C(CF3)2, -COO-, -SO- and -SO2-; P = 1-10; and a = 0-3.

USE - For polymer electrolyte fuel cell.

ADVANTAGE - The **polymer electrolyte membrane** has low dependency of **ion conductivity** on humidity, and has desirable power-generating performance regardless of the variation of temperature and humidity. The **polymer electrolyte membrane** has excellent mechanical strength, hot-water resistance, oxidation-resistance, creep resistance (durability) and high efficiency. The polymer electrolyte fuel cell is inexpensive, since the polyarylene does not contain fluorine in its molecular structure.

DESCRIPTION OF DRAWING(S) - The figure shows cross-sectional view showing the membrane electrode assembly constituting the polymer electrolyte fuel cell.

Polymer electrolyte membrane 1
Electrodes 2,3
Separator plates 6
Dwg.1/3

FS CPI EPI

FA AB; GI
MC CPI: A10-E12A; A11-B04; A12-E09; L03-E04A2; L03-E04B
EPI: X16-C01C; X16-E06

L63 ANSWER 7 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:171005 HCAPLUS
DN 137:127445
TI Properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells
AU Bae, J.-M.; Honma, I.; Murata, M.; Yamamoto, T.; Rikukawa, M.; Ogata, N.
CS Chemical Technology Division, Argonne National Laboratory, Argonne, IL, 60439, USA
SO Solid State Ionics (2002), 147(1,2), 189-194
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier Science B.V.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 28, 39
AB Two kinds of polymers were fabricated and tested as candidates of proton-conducting **membranes** for **polymer electrolyte** fuel cell (PEFC) applications. Poly benzimidazole (PBI) and poly(4-phenoxybenzoyl-1,4-phenylene, Poly-X 2000) (PPBP) were sulfonated and characterized as proton-conducting membranes. PBI was sulfonated as PBI-PS (from 1,3-propanesultone) and PBI-BS (from 1,4-butanesultone). PPBP was prepd. at various sulfonation levels. Proton conductivities were measured at 60-160.degree.. Power output characteristics of both polymers were measured by using com. Pt/C electrodes.
ST sulfonated **polymer** proton conducting **electrolyte** electrode **membrane** fuel cell; polybenzimidazole polyphenyl sulfonated fuel cell electrode
IT Polybenzimidazoles
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(deprotonated, reaction product with alkanesultones, lithium salt; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
IT Electric potential
(for proton abstraction in fabrication of sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
IT Polybenzimidazoles
RL: RCT (Reactant); RACT (Reactant or reagent)
(for proton abstraction in fabrication of sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
IT Electric conductivity
(of protons; for proton abstraction in fabrication of sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
IT **Ionic conductors**
(polymeric; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
IT Fuel cell electrolytes
Fuel cells
Polymer electrolytes
(properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
IT Cation exchange membranes
(proton-conducting, solvent-**cast**; properties of selected

sulfonated polymers as proton-conducting electrolytes for polymer
electrolyte fuel cells)

IT Polymers, uses
Polyphenyls
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(sulfonated; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses 7440-44-0, Carbon, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(electrode; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 127-19-5, n,n-Dimethylacetamide
RL: NUU (Other use, unclassified); USES (Uses)
(for proton abstraction in fabrication of sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 7580-67-8, Lithium hydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(for proton abstraction in fabrication of sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 1120-71-4, 1,3-Propanesultone 1633-83-6, 1,4-Butanesultone
RL: RCT (Reactant); RACT (Reactant or reagent)
(for sulfonation of in fabrication of sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 1333-74-0, Hydrogen (H2), uses
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(fuel for fuel cell; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 7440-21-3, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(membrane support; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 154100-93-3DP, Poly-X 2000, sulfonated
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 1120-71-4D, 1,3-Propanesultone, reaction products with polybenzimidazole
1633-83-6D, 1,4-Butanesultone, reaction products with polybenzimidazole
25734-65-0D, Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene, reaction products with 1,3-propanesultone or 1,4-butanesultone
RL: TEM (Technical or engineered material use); USES (Uses)
(properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT **25734-65-0**, Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfoalkylation of; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

IT 154100-93-3, Poly-X 2000
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfonation of; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

(1) Appleby, A; Fuel Cell Handbook 1989
(2) Bae, J; J Korean Phys Soc 1999, V35, PS315 HCAPLUS
(3) Blomen, L; Fuel Cell Systems 1993
(4) Gielsman, M; Macromolecules 1992, V25, P4832
(5) Gielsman, M; Macromolecules 1993, V26, P5633
(6) Honma, I; Solid State Ionics 1999, V118, P29 HCAPLUS
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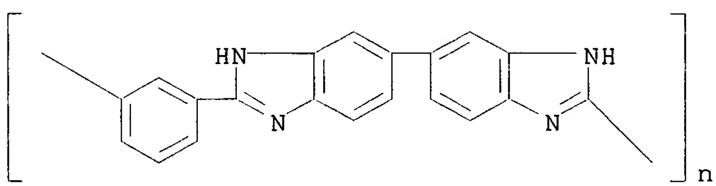
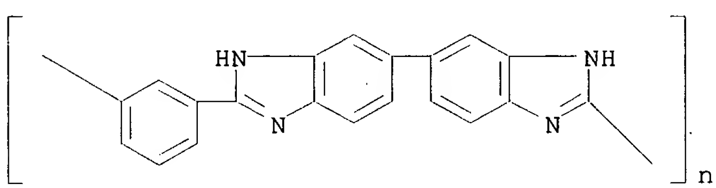
(9) Ogata, N; Senni-Gakkaisi 1990, V46, P52
(10) Samms, S; J Electrochem Soc 1996, V143, P1225 HCAPLUS
(11) Savinell, R; 49th Annual Meeting 1998, P755
(12) Springer, T; J Electrochem Soc 1993, V140, P3513 HCAPLUS
(13) Wang, J; J Appl Electrochem 1996, V26, P751 HCAPLUS

IT **25734-65-0D**, Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene, reaction products with 1,3-propanesultone or 1,4-butanesultone
RL: TEM (Technical or engineered material use); USES (Uses)
(properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
RN 25734-65-0 HCAPLUS
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene) (9CI) (CA INDEX NAME)



IT **25734-65-0**, Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene
RL: RCT (Reactant); RACT (Reactant or reagent)
(sulfoalkylation of; properties of selected sulfonated polymers as proton-conducting electrolytes for polymer electrolyte fuel cells)
RN 25734-65-0 HCAPLUS
CN Poly([5,5'-bi-1H-benzimidazole]-2,2'-diyl-1,3-phenylene) (9CI) (CA INDEX NAME)



L63 ANSWER 8 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 1020512713 JICST-EPlus
TI Present State and Novel Development of **Polymer Electrolyte Membranes** for Direct Methanol Fuel Cell.
AU YAMAGUCHI TAKEO
CS Univ. Tokyo, Graduate School of Engineering, JPN
SO Maku (Membrane), (2002) vol. 27, no. 3, pp. 124-130. Journal Code: F0900B (Fig. 6, Ref. 21)
CODEN: MAKUD9; ISSN: 0385-1036
CY Japan

DT Journal; Commentary
LA Japanese
STA New
AB To develop a high performance direct methanol fuel cell(DMFC), a novel electrolyte membrane is needed. This electrolyte membrane should be durable up to 130.DEG.C. to improve the catalytic reaction, and the methanol crossover should be reduced. Reported membranes are reviewed in this article, and our own approach is shown. Our approach is to design a pore-filling type polyelectrolyte membrane, where the polyelectrolyte is filled into the pores of a porous **substrate**, and the membrane swelling is suppressed by the **substrate** matrix. Proton conductivity was achieved through the filling electrolyte polymer. Methanol permeation was controlled by the swelling of the electrolyte polymer, and the mechanical strength at high temperature was maintained by the **substrate**. From this concept, a high proton conductivity was shown to exist with reduced membrane methanol permeability, and in addition, a heat-resistance was also achieved. (author abst.)
CC YB04040V; YH07150C (621.352.6; 678.5/.8)
CT **solid** electrolyte fuel cell; liquid fuel cell; alcohol fuel; polymer membrane; **solid** polyelecrolyte; **ionic conduction**; proton shift; research and development; **composite** material; porous medium; graft copolymerization; radical polymerization; fuel cell; polyelectrolyte
BT chemical cell; battery; liquid fuel; fuel; functional polymer; macromolecule; membrane and film; electrolyte; matter; **solid** electrolyte; electric conduction; electrical property; transfer; development; material; porous object; copolymerization; polymerization; chemical reaction
ST polymer electrolyte fuel cell

L63 ANSWER 9 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:713457 HCAPLUS
DN 135:243473
TI Preparation of **ion conducting polymers** and **composite electrolyte membrane** therefrom
IN Charnock, Peter; Wilson, Brian; Bridges, Richard Frank
PA Victrex Manufacturing Limited, UK
SO PCT Int. Appl., 63 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C08J005-22
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 35, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001070858	A2	20010927	WO 2001-GB1243	20010321
	WO 2001070858	A3	20011227		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRAI GB 2000-6883 A 20000322
GB 2000-31209 A 20001221

AB A **composite** material, for example a **composite membrane** for a **polymer electrolyte membrane** fuel cell includes a first conductive polymer and a support material for the polymer, wherein the support material comprises a second conductive polymer. A method making of the **composite** material is also disclosed as is its use as a **polymer electrolyte membrane** in a fuel cell. Thus, a microporous **ion conducting** membrane prepd. by **casting** a soln. contg. a 1:1 blend of polyetherketone and a sulfonated copolymer of 4,4'-difluorobenzophenone, 4,4'-dihydroxybenzophenone, and 4,4'-dihydroxybiphenyl was impregnated with a 15% soln. of a sulfonated copolymer of 4,4'-difluorobenzophenone, 4,4'-dihydroxybiphenyl, and 4,4'-dihydroxydiphenylsulfone and the **composite** membrane was strong and flexible.

ST sulfonated polymer **ion conducting** membrane prepn; fuel cell **membrane polymer electrolyte ion conducting**

IT **Membranes**, nonbiological
(**composite**, microporous; prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Polyketones
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, arom., sulfonated, reaction products; prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Polysulfones, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, sulfonated; prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Polyethers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-, arom., sulfonated, reaction products; prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Ionomers
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg.; in prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Polyethers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polysulfone-, sulfonated; prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT **Conducting** polymers
Polymer electrolytes
(prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Polymer blends

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT Fuel cells
(prepn. of **ion conducting polymers** for **composite electrolyte membrane** in fuel cell)

IT **71957-60-3DP**, 4,4'-Difluorobenzophenone-4,4'-dihydroxybenzophenone-hydroquinone copolymer, sulfonated **83094-08-0DP**, 4,4'-Dichlorodiphenylsulfone 4,4'-dihydroxybiphenyl 4,4'-dihydroxydiphenylsulfone copolymer, sulfonated **128324-23-2DP**, 4,4'-Difluorobenzophenone-4,4'-dihydroxybenzophenone-4,4'-dihydroxybiphenyl copolymer, sulfonated **128324-24-3DP**, 4,4'-Difluorobenzophenone-4,4'-dihydroxybiphenyl-4,4'-dihydroxydiphenylsulfone copolymer, sulfonated
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

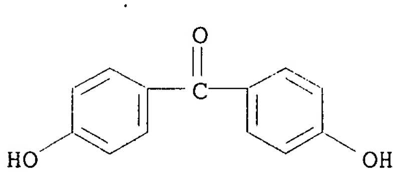
IT **27380-27-4**
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

IT **71957-60-3DP**, 4,4'-Difluorobenzophenone-4,4'-dihydroxybenzophenone-hydroquinone copolymer, sulfonated **83094-08-0DP**, 4,4'-Dichlorodiphenylsulfone 4,4'-dihydroxybiphenyl 4,4'-dihydroxydiphenylsulfone copolymer, sulfonated **128324-23-2DP**, 4,4'-Difluorobenzophenone-4,4'-dihydroxybenzophenone-4,4'-dihydroxybiphenyl copolymer, sulfonated **128324-24-3DP**, 4,4'-Difluorobenzophenone-4,4'-dihydroxybiphenyl-4,4'-dihydroxydiphenylsulfone copolymer, sulfonated
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of **ion conducting polymers** for **composite electrolyte membrane**)

RN 71957-60-3 HCAPLUS
CN Methanone, bis(4-fluorophenyl)-, polymer with 1,4-benzenediol and bis(4-hydroxyphenyl)methanone (9CI) (CA INDEX NAME)

CM 1

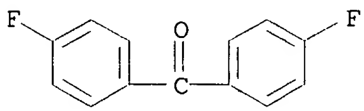
CRN 611-99-4
CMF C13 H10 O3



CM 2

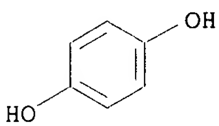
CRN 345-92-6

CMF C13 H8 F2 O



CM 3

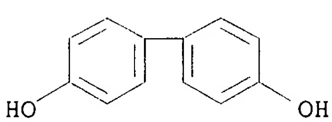
CRN 123-31-9
CMF C6 H6 O2



RN 83094-08-0 HCAPLUS
CN [1,1'-Biphenyl]-4,4'-diol, polymer with 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

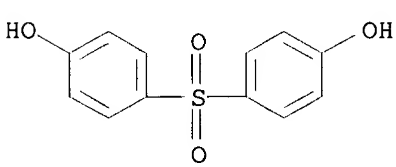
CM 1

CRN 92-88-6
CMF C12 H10 O2



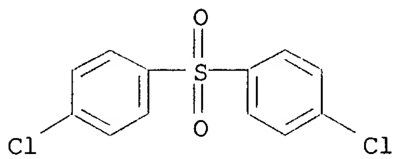
CM 2

CRN 80-09-1
CMF C12 H10 O4 S



CM 3

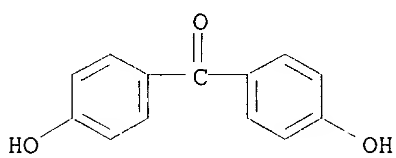
CRN 80-07-9
CMF C12 H8 Cl2 O2 S



RN 128324-23-2 HCAPLUS
CN Methanone, bis(4-fluorophenyl)-, polymer with [1,1'-biphenyl]-4,4'-diol and bis(4-hydroxyphenyl)methanone (9CI) (CA INDEX NAME)

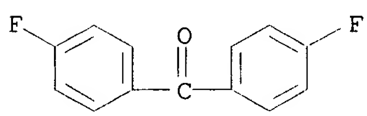
CM 1

CRN 611-99-4
CMF C13 H10 O3



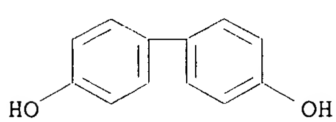
CM 2

CRN 345-92-6
CMF C13 H8 F2 O



CM 3

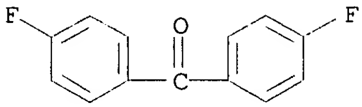
CRN 92-88-6
CMF C12 H10 O2



RN 128324-24-3 HCAPLUS
CN Methanone, bis(4-fluorophenyl)-, polymer with [1,1'-biphenyl]-4,4'-diol and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

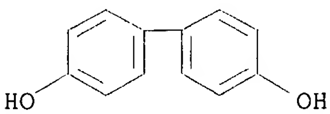
CM 1

CRN 345-92-6
CMF C13 H8 F2 O



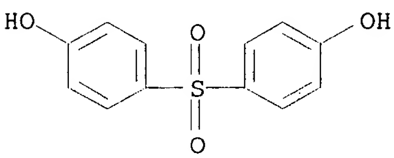
CM 2

CRN 92-88-6
CMF C12 H10 O2

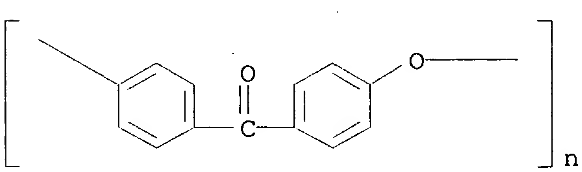


CM 3

CRN 80-09-1
CMF C12 H10 O4 S



IT **27380-27-4**
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(prepn. of **ion conducting polymers** for **composite electrolyte membrane**)
RN 27380-27-4 HCAPLUS
CN Poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



L63 ANSWER 10 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:713456 HCAPLUS
DN 135:258274
TI Preparation of ion-exchange membrane based on sulfonated polyether-polyketone-polysulfone
IN Bridges, Richard Frank; Charnock, Peter; Kemmish, David John; Wilson, Brian

PA Victrex Manufacturing Limited, UK
SO PCT Int. Appl., 59 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C08J005-22
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 35, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001070857	A2	20010927	WO 2001-GB1232	20010321
	WO 2001070857	A3	20011220		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRAI GB 2000-6880 A 20000322
GB 2000-31208 A 20001221

AB An ion-exchange material, for example a **polymer electrolyte membrane** or gas diffusion electrode comprises a semi-cryst. copolymer comprising: a first unit which includes an **ion**-exchange site; a **second** cryst. unit; and a third unit which is amorphous. The third unit is used to disrupt the crystallinity of the copolymer thereby to increase its soly. in solvents. The material described may be used in fuel cells. Thus, copolymers of 4,4'-difluorobenzophenone-4,4'-dihydroxybenzophenone-4,4'-dihydroxybiphenyl-4,4'-dihydroxydiphenylsulfone were sulfonated and membranes having crystallinity index of 0-7.1% were **cast**.

ST **membrane polymer electrolyte** blend prepn; cryst sulfonated polyether polysulfone polyketone prepn; **ion conducting** polymer gas diffusion electrode fuel cell

IT Polyketones
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-, arom., sulfonated, reaction products; prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT Polysulfones, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polyketone-, sulfonated; prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT Polyketones
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether-polysulfone-, sulfonated; prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT Polyethers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(polyketone-, arom., sulfonated, reaction products; prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT Polyethers, uses
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyketone-polysulfone-, sulfonated; prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT Crystallinity
Fuel cells
Ion exchange **membranes**
Polymer electrolytes
(prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT Polymer blends
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

IT **128324-23-2P**, 4,4'-Difluorobenzophenone 4,4'-dihydroxybenzophenone 4,4'-dihydroxybiphenyl copolymer **128324-24-3P**, 4,4'-Difluorobenzophenone 4,4'-dihydroxybiphenyl 4,4'-dihydroxydiphenylsulfone copolymer **361482-41-9DP**, sulfonated **361482-42-0P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

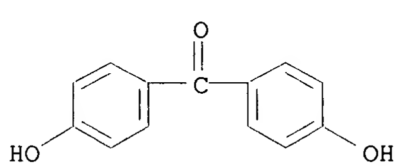
IT **128324-23-2P**, 4,4'-Difluorobenzophenone 4,4'-dihydroxybenzophenone 4,4'-dihydroxybiphenyl copolymer **128324-24-3P**, 4,4'-Difluorobenzophenone 4,4'-dihydroxybiphenyl 4,4'-dihydroxydiphenylsulfone copolymer **361482-41-9DP**, sulfonated **361482-42-0P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of ion-exchange **membrane** based on sulfonated polyether-polyketone-polysulfone)

RN 128324-23-2 HCAPLUS

CN Methanone, bis(4-fluorophenyl)-, polymer with [1,1'-biphenyl]-4,4'-diol and bis(4-hydroxyphenyl)methanone (9CI) (CA INDEX NAME)

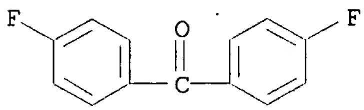
CM 1

CRN 611-99-4
CMF C13 H10 O3



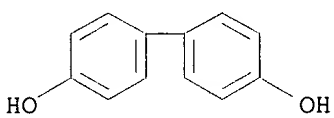
CM 2

CRN 345-92-6
CMF C13 H8 F2 O



CM 3

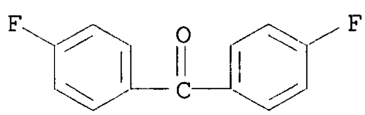
CRN 92-88-6
CMF C12 H10 O2



RN 128324-24-3 HCAPLUS
CN Methanone, bis(4-fluorophenyl)-, polymer with [1,1'-biphenyl]-4,4'-diol and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

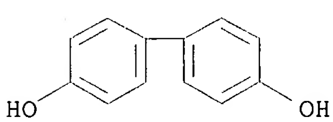
CM 1

CRN 345-92-6
CMF C13 H8 F2 O



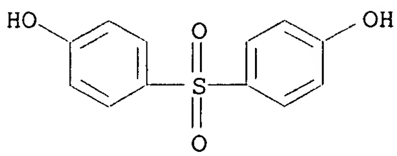
CM 2

CRN 92-88-6
CMF C12 H10 O2



CM 3

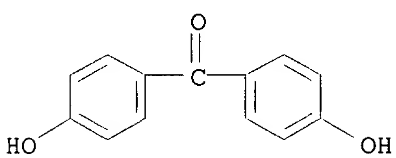
CRN 80-09-1
CMF C12 H10 O4 S



RN 361482-41-9 HCAPLUS
CN Methanone, bis(4-fluorophenyl)-, polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-hydroxyphenyl)methanone and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

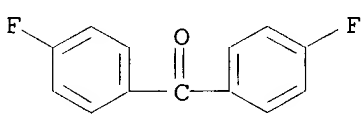
CM 1

CRN 611-99-4
CMF C13 H10 O3



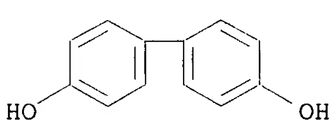
CM 2

CRN 345-92-6
CMF C13 H8 F2 O



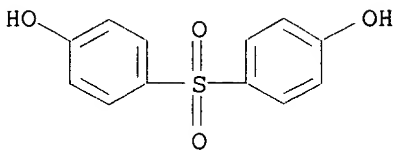
CM 3

CRN 92-88-6
CMF C12 H10 O2



CM 4

CRN 80-09-1
CMF C12 H10 O4 S

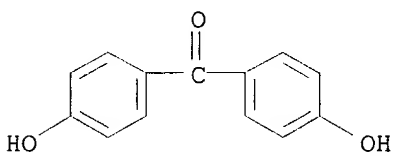


RN 361482-42-0 HCAPLUS

CN Methanone, bis(4-fluorophenyl)-, polymer with [1,1'-biphenyl]-4,4'-diol, bis(4-hydroxyphenyl)methanone and (2-hydroxyphenyl)(4-hydroxyphenyl)methanone (9CI) (CA INDEX NAME)

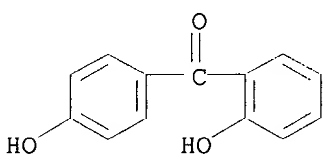
CM 1

CRN 611-99-4
CMF C13 H10 O3



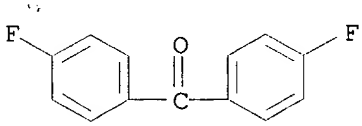
CM 2

CRN 606-12-2
CMF C13 H10 O3



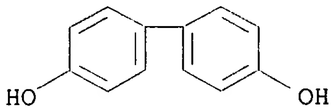
CM 3

CRN 345-92-6
CMF C13 H8 F2 O



CM 4

CRN 92-88-6
CMF C12 H10 O2



L63 ANSWER 11 OF 82 HCAPLUS

AN 2001:208039 HCAPLUS
DN 134:210602
TI Production of composite polymer membrane for direct methanol type fuel cells
IN Akita, Hiroshi; Ichikawa, Masao; Iguchi, Masaru; Oyanagi, Hiroyuki
PA Honda Giken Kogyo Kabushiki Kaisha, Japan
SO Eur. Pat. Appl., 12 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M008-10
ICS H01B001-12; B01D069-12; B01D071-60
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1085590	A1	20010321	EP 2000-120488	20000919
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001081220	A2	20010327	JP 1999-265114	19990920
	US 6465120	B1	20021015	US 2000-664087	20000918
PRAI	JP 1999-265114	A	19990920		

AB A **solid polymer electrolyte membrane** excellent in proton cond. and methanol barrier property, is composed of a composite membrane obtained by allowing aniline to be adsorbed by a perfluorosulfonic acid polymer membrane, and subjecting the aniline to oxidative polymn. to form a polyaniline-contg. polymer membrane.
ST fuel cell membrane polyaniline contg; Nafion polyaniline composite fuel cell membrane
IT Membranes, nonbiological
(composite; prodn. of composite polymer membrane for direct methanol type fuel cells)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(fluorine- and sulfo-contg., ionomers; prodn. of composite polymer membrane for direct methanol type fuel cells)
IT Polymerization
(oxidative; prodn. of composite polymer membrane for direct methanol type fuel cells)
IT Fluoropolymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(polyoxyalkylene-, sulfo-contg., ionomers; prodn. of composite polymer membrane for direct methanol type fuel cells)
IT Ionomers
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg.; prodn. of composite polymer membrane for direct methanol type fuel cells)
IT Adsorption

Fuel cell **electrolytes**
Fuel cells
Permeation
(prodn. of **composite polymer** membrane for direct methanol type fuel cells)

IT Polyanilines
RL: DEV (Device component use); **SPN (Synthetic preparation); PREP (Preparation);** USES (Uses)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

IT **Ionic conductivity**
(proton; prodn. of composite polymer membrane for direct methanol type fuel cells)

IT 163294-14-2, Nafion 112
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

IT **25233-30-1P**, Polyaniline
RL: DEV (Device component use); **SPN (Synthetic preparation); PREP (Preparation);** USES (Uses)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

IT 62-53-3, Aniline, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

IT 66796-30-3, Nafion 117
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

IT 7727-54-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

IT 67-56-1, Methanol, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

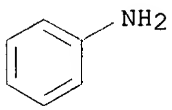
RE
(1) Adebert, P; JPURNAL OF THE CHEMICAL SOCIETY, CHEMICAL COMMUNICATIONS 1986, P1636
(2) Bidan, G; JOURNAL OF THE CHEMICAL SOCIETY, CHEMICAL COMMUNICATIONS 1989, 20, P1568 HCAPLUS
(3) Commissariat Energie Atomique; FR 2632979 A 1989 HCAPLUS
(4) Fabrizio, M; JOURNAL OF THE ELECTROANALYTICAL CHEMISTRY 1992, V323(1), P197
(5) LI, N; JOURNAL OF APPLIED ELECTROCHEMISTRY 1992, V22, P512 HCAPLUS
(6) Nippon Electric Co; EP 0654804 A 1995 HCAPLUS

IT **25233-30-1P**, Polyaniline
RL: DEV (Device component use); **SPN (Synthetic preparation); PREP (Preparation);** USES (Uses)
(prodn. of composite polymer membrane for direct methanol type fuel cells)

RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



L63 ANSWER 12 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 2001-343089 [36] WPIX
DNN N2001-248484 DNC C2001-106149
TI **Polymer electrolyte membrane** fuel cells used in automobiles includes an acid-doped solid electrolyte e.g., polymer blend comprising polyimidazole and a thermoplastic polymer between gas diffusion anode and gas diffusion cathode.
DC A14 A23 A25 A85 L03 X16 X21
IN BJERRUM, N J; HJULER, H A; LI, Q
PA (DAPO-N) DANISH POWER SYSTEMS APS
CYC 95
PI WO 2001018894 A2 20010315 (200136)* EN 49p H01M008-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000069845 A 20010410 (200137) H01M008-00
EP 1222707 A2 20020717 (200254) EN H01M008-10
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
ADT WO 2001018894 A2 WO 2000-DK495 20000908; AU 2000069845 A AU 2000-69845 20000908; EP 1222707 A2 EP 2000-958269 20000908, WO 2000-DK495 20000908
FDT AU 2000069845 A Based on WO 200118894; EP 1222707 A2 Based on WO 200118894
PRAI DK 1999-1828 19991220; DK 1999-1274 19990909
IC ICM H01M008-00; H01M008-10
ICS H01M004-86
AB WO 200118894 A UPAB: 20010628
NOVELTY - **Polymer electrolyte membrane** fuel cells includes an acid-doped solid electrolyte e.g., polymer blend comprising polyimidazole and a thermoplastic polymer sandwiched between gas diffusion anode and gas diffusion cathode.

DETAILED DESCRIPTION - Method for preparing a **polymer electrolyte membrane** for fuel cells comprises:

(a) providing an acid-doped solid electrolyte (5);

(b) providing a gas diffusion cathode by:

(i) providing a first hydrophobic carbon support **substrate** (10) by treatment of a carbon **substrate** with a hydrophobic polymer solution;

(ii) providing a first supporting layer (9) on the first support **substrate** by **casting** a slurry comprising carbon black and a hydrophobic polymer onto the **substrate;**

(iii) providing a first catalyst layer (8) on the first supporting layer by **casting** a slurry comprising carbon-supported noble metal catalysts and a polymer binder on the supporting layer; and

(iv) doping the first catalyst layer with an acid or a mixture of acids, preferably a non-volatile acid and a volatile acid; and

(c) providing a gas diffusion anode which comprises a second hydrophobic carbon support **substrate** (4), a second supporting layer (3) and a second catalyst layer (2) by carrying out steps (i) to (iv) above; and

(d) assembling the **polymer electrolyte membrane** (PEM) by sandwiching the gas diffusion anode, the solid electrolyte and the gas diffusion cathode so that the first and second catalyst layers both face the solid electrolyte.

INDEPENDENT CLAIMS are also included for the following:

(i) a **polymer electrolyte membrane** (PEM) for use in fuel cells;

(ii) a **polymer electrolyte membrane** fuel cell;

(iii) a fuel cell;

(iv) a method for operating a **polymer electrolyte membrane** fuel cell; and

(v) a solid **electrolyte** for **polymer electrolyte membrane** fuel cells.

USE - Fuel cell is used in automobiles.

ADVANTAGE - The fuel cell has good performance and high tolerance to fuel impurities e.g., carbon monoxide. The polymer blend electrolyte exhibits high **ionic conductivity**, enhanced mechanical properties at operational temperatures and is easy to handle during its preparation.

DESCRIPTION OF DRAWING(S) - The diagram shows the structure of a fuel cell.

Gas channel 1
Anodic catalyst layer 2
Anodic supporting layer 3
Anodic back 4
Solid **electrolyte** (**polymer membrane electrolyte**) 5
Anodic current collector 6
Cathode current collector 7
Cathodic catalyst layer 8
Cathodic supporting layer 9
Cathodic back 10
Oxidant gas 11
Fuel gas 12
Dwg.12/12

FS CPI EPI
FA AB; GI
MC CPI: A11-B05D; A12-E06A; A12-E06B; A12-T04C; L03-E04
EPI: X16-C01C; X16-J01A; X21-A01F; X21-B01A

L63 ANSWER 13 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 2001-203030 [20] WPIX
DNN N2001-144852 DNC C2001-060375
TI All-solid-state laminar electrochemical battery cell for a defined capacity battery or leakproof battery has solid polymer electrolyte layer comprising base polymer material of high conductivity at room temperature.
DC A85 L03 V01 X12 X16
IN MUNSHI, M Z A
PA (LITH-N) LITHIUM POWER TECHNOLOGIES INC
CYC 93
PI WO 2001017052 A2 20010308 (200120)* EN 51p H01M010-40
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC

LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE
SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
AU 2000070638 A 20010326 (200137) H01M010-40
ADT WO 2001017052 A2 WO 2000-US22917 20000821; AU 2000070638 A AU 2000-70638 20000821
FDT AU 2000070638 A Based on WO 200117052
PRAI US 1999-388733 19990902
IC ICM H01M010-40
ICS H01B001-12; H01G009-02
AB WO 200117052 A UPAB: 20010410

NOVELTY - An all-solid-state laminar electrochemical battery cell comprises a layer of solid polymer electrolyte which is a cationic conductor having a conductivity of at least 10-4 S/cm at 25 deg. C and comprising a mixture of a base polymer material comprising **ionically conductive** polymer(s) and having an initial conductivity of at least 1 multiply 10-5 S/cm at 25 deg. C when combined with a metal salt.

DETAILED DESCRIPTION - An all-solid-state laminar electrochemical cell for a battery comprises an anode layer (60); a cathode layer (20); an anode current collector attached to the anode; a cathode current collector attached to the cathode; and a solid polymer electrolyte layer (70) between anode and cathode layers. The solid polymer electrolyte which is a cationic conductor having a conductivity of at least 10-4 S/cm at 25 deg. C comprises a base polymer material, a metal salt, an inorganic filler, and an **ionic conducting** material. The base polymer material comprises **ionically conductive** polymer(s) and has an initial conductivity of at least 1 multiply 10-5 S/cm at 25 deg. C when combined with the metal salt. The inorganic filler has an average particle size of less than 0.05 mu m in diameter and a surface area of at least 100 m2/g. The **ionic conducting** material has an average particle size of less than 0.1 mu m in diameter and an initial **ionic conductivity** of at least 2 multiply 10-3 S/cm at 25 deg. C.

INDEPENDENT CLAIMS are also included for the following:

(A) a method of making an ultra-thin solid polymer electrochemical cell by forming a cathode/polymer electrolyte/anode laminate and optionally winding and shaping the laminate;

(B) a method of making a strong and flexible electrode/electrolyte half-element for a laminar battery;

(C) a method of making a thin bipolar battery; and

(D) a high-speed manufacturing method for producing an ultra-thin laminar battery comprising **extruding** a uniform layer of lithium solid **polymer electrolyte composition** into a thin cathode sheet while the cathode sheet roll is drawn at a uniform rate by an uptake reel; and curing the **extruded polymer electrolyte composition** as the **composite** is continuously wound by the uptake reel.

USE - As an all-solid-state electrochemical cell for a defined capacity battery, leakproof battery, overcharge-tolerant battery, or orientation-tolerant battery.

ADVANTAGE - The electrochemical cells and batteries employ a thermodynamically stable dry polymer electrolyte that can be manufactured using high speed **extrusion** or deposition techniques. The cells have good **ionic conductivity** at room temperature and below so that performance is improved. The polymeric electrolyte is strong yet flexible, dry and non-tacky. The batteries have a higher current drain capability, lower resistance, higher energy content, lower self-discharge rate, and a wider operating temperature range than known solid state batteries. The rechargeable batteries have freedom from dendrite formation, higher efficiency, lower internal resistance, greater capacity

utilization, higher cycle life, and better reliability and safety than a rechargeable metal ion battery. These batteries are also better able to tolerate overcharge and will not lead to the emission of deleterious species or outgassing. Less lithium in the cell is used so that cost is reduced and energy content is increased.

DESCRIPTION OF DRAWING(S) - The figure shows the combined cathode, anode, and electrolyte components and a metallized end spray.

Cathode layer 20

Anode layer 60

Solid polymer electrolyte layer 70

Dwg.2/4

FS CPI EPI

FA AB; GI

MC CPI: A11-B07A; A11-C02C; A12-E06; A12-E09; L03-E01C

EPI: V01-B01B1; V01-B01B3; V01-B01C; X12-D01C1; X16-B01F1; X16-J01A; X16-J08

L63 ANSWER 14 OF 82 WPIX (C) 2002 THOMSON DERWENT

AN 2002-264949 [31] WPIX

DNC C2002-078839

TI Method for manufacturing **composite polymer electrolyte membrane** for **polymer electrolyte membrane** fuel cell.

DC A85 L03 X16

IN CHOI, H J; HA, H Y; HONG, S A; LIM, T H; NAM, S U; OH, I H; SIM, J P

PA (KOAD) KOREA ADV INST SCI & TECHNOLOGY

CYC 1

PI KR 2001091642 A 20011023 (200231)* 1p H01M008-10

ADT KR 2001091642 A KR 2000-13526 20000317

PRAI KR 2000-13526 20000317

IC ICM H01M008-10

AB KR2001091642 A UPAB: 20020516

NOVELTY - A method for manufacturing a **composite polymer electrolyte membrane** for a **polymer electrolyte membrane** fuel cell is provided to manufacture a **composite** polymer membrane which is thin, and has high **ionic conductivity** and physical strength by impregnating a porous **membrane** with **polymer electrolyte** resin in a form of perfluorosulfonyl halogen compound using various methods.

DETAILED DESCRIPTION - The method comprises the steps of impregnating an inert porous polymer membrane with a perfluorosulfonyl halogen compound resin; and converting the impregnated perfluorosulfonyl halogen compound into sulfuric acid by sequentially treating high temperature alkaline solution, sulfuric acid solution and ultra pure water on the coated polymer membrane, wherein the porous polymer membrane has a porosity of 30 to 90%, a pore size of 0.05 to 5.0 microns and a thickness of 10 to 150 microns, and is selected from the group consisting of porous poly tetrafluoroethylene membrane, polypropylene membrane, polyethylene membrane and poly vinylidene fluoride membrane, wherein the impregnating step is carried out in a method selected from the group consisting of a spraying, painting, tape **casting**, screen painting, dipping, calendering and doctor blade method at a temperature of 230 to 320 deg. C, wherein the method further comprises the steps of coating an electrolyte film on the surface of the manufactured **composite** electrolyte membrane and heating the electrolyte film coated **composite** electrolyte membrane in ultra pure water or vapor having a temperature of 80 to 150 deg. C for 1 or more hours, and wherein the electrolyte film is selected from the group consisting of perfluorosulfonyl fluoride and a polymer material in which an alkali metal ion such as sodium or potassium

is substituted for perfluoro sulfonic acid, perfluorocarboxylic acid, polystyrene sulfonic acid, polystyrene carboxylic acid or their mixture, the coated film has a thickness of 1 to 50 microns, and the method for additionally coating the film is performed by a method selected from the group consisting of spraying, painting, tape **casting**, screen painting and dipping.
Dwg.1/10

FS CPI EPI
FA AB; GI
MC CPI: A11-B05; A11-C04B; A12-E06B; A12-M02; L03-E04
EPI: X16-C01

L63 ANSWER 15 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 1010736296 JICST-EPlus
TI Preparation and Characterization of Lithium **Ion Conducting** Glass-Polymer **Composites.**
AU HAYASHI A; MATSUDA A; TATSUMISAGO M; MINAMI T
KITADE T; KOHIIYA S
IKEDA Y
CS Osaka Prefecture Univ., Osaka
Kyoto Univ., Kyoto
Kyoto Inst. Technol., Kyoto
SO Chem Lett, (2001) no. 8, pp. 814-815. Journal Code: S0742A (Fig. 3, Ref. 13)
CODEN: CMLTAG; ISSN: 0366-7022
CY Japan
DT Journal; Short Communication
LA English
STA New
AB Glass-**polymer composite electrolytes** of high lithium **ion conducting** oxysulfide glass and the comb-shaped poly(oxyethylene) polymer (TEC-19) were prepared. The conductivity of the **composite** with 2 vol% TEC-19 doped with LiClO4 was 1*10-3 at 100.DEG.C. and 3*10-5 S cm-1 at 30.DEG.C.. The **composite** exhibited a 4 V stable potential window versus Li+/Li. (author abst.)
CC YB04030K (621.355)
CT organic-inorganic polymer hybrid; **composite** material; silicate glass; lithium silicate; sulfide(chalcogenide); polyethylene oxide; comb-shaped polymer; **solid** electrolyte; **ionic conduction**; electrical conductivity; temperature dependence; lithium perchlorate; doping; cyclic voltammetry; lithium secondary battery; copolymer
BT polymer complex; macromolecule; complex(substance); material; glass; ceramics; silicate(salt); silicon oxoate; silicon compound; carbon group element compound; oxoate; oxygen compound; oxygen group element compound; lithium compound; alkali metal compound; sulfur compound; chalcogenide; polyalkylene oxide; thermoplastic; plastic; polyether; polymer; electrolyte; matter; electric conduction; electrical property; ratio; transport coefficient; coefficient; dependence; perchlorate; chlorine oxoate; chlorine compound; halogen compound; halogen oxoate; voltammetry; instrumental analysis; analysis(separation); analysis; secondary battery; chemical cell; battery

L63 ANSWER 16 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:704255 HCAPLUS
DN 136:7077
TI Characterization of polymer electrolyte thin film using an interdigitated microarray electrode
AU Ojima, Hiroyuki; Umeda, Minoru; Mohamedi, Mohamed; Uchida, Isamu

CS Department of Applied Chemistry, Graduate School of Engineering, Tohoku University, Sendai-shi, 980-8579, Japan
SO Nippon Kagaku Kaishi (2001), (9), 501-505
CODEN: NKAKB8; ISSN: 0369-4577
PB Nippon Kagakkai
DT Journal
LA Japanese
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 76
AB Studies have been performed on a **cast** coated Nafion thin film deposited on an interdigitated microarray electrode in order to elucidate its basic characteristics. Cond. dependence on relative humidity and temp. were clearly obsd. Chem. activation process of the Nafion film by H2O2 and H2SO4 aq. solns. effectively enhanced the AC-cond. Heat treatment of the Nafion, esp. at temp. higher than 200.degree., also decreased the cond., which was never recovered by the chem. activation. Interestingly, after cooling in liq. nitrogen, the cond. was perfectly recovered. Furthermore, DC current-voltage (I-V) curves were measured varying the relative humidity in order to compare with results of the AC-cond. measurements. Two kinds of processes for water mols. in the film were strongly suggested; one concerns an **ionic conduction** and the other concerns an electrode reaction. When the film was exposed to methanol satd. nitrogen gas, the I-V profile dramatically changed, which indicates an irreversible change in the **cast**-coated Nafion thin film.
ST Nafion polyelectrolyte film **ion** elec **conduction**
IT Electric conductivity
Ion exchange **membranes**
Ionic conductivity
(characterization of **polymer electrolyte** thin film using interdigitated microarray electrode)
IT Cooling
Heat treatment
(effect on properties of polymer electrolyte thin film)
IT Polyoxyalkylenes, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-contg., ionomers; characterization of polymer electrolyte thin film using interdigitated microarray electrode)
IT Fluoropolymers, uses
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-contg., ionomers; characterization of polymer electrolyte thin film using interdigitated microarray electrode)
IT Ionomers
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg.; characterization of polymer electrolyte thin film using interdigitated microarray electrode)
IT Humidity
(relative; effect on properties of polymer electrolyte thin film)

L63 ANSWER 17 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 1020212879 JICST-EPlus
TI Proton Conducting Organic/Inorganic Nano-Hybrid **Polymer Electrolytes Membrane.**
AU HONMA ITARU; NAKAJIMA HITOSHI
NISHIKAWA OSAMU; SUGIMOTO TOSHIYA; NOMURA SHIGEKI
IWASA TAKAHIRO

CS National Inst. Advanced Industrial Sci. and Technol.
Sekisuikagakukogyo Tsukubaken
Chiba Inst. of Technol.
SO Nippon Kagakkai Koen Yokoshu, (2001) vol. 80th, pp. 50. Journal Code: S0493A (Fig. 1)
ISSN: 0285-7626
CY Japan
DT Conference; Short Communication
LA Japanese
STA New
AB Proton Conducting Organic/Inorganic Nano-Hybrid **Polymer electrolytes Membrane** has been synthesized by Sol-Gel processes. The membrane was composed of high temperature tolerant polymer and **solid** acid cluster with homogeneous mixture at nano scale. The membrane shows proton conductivity up to 160.DEG.C. of approximately 10mS/cm, which excess the properties of that of Nafion membrane. The hybrid membrane can be applied to intermediate temperature operated PEMFC. (author abst.)
CC YB04040V (621.352.6)
CT polyelectrolyte; organic-inorganic polymer hybrid; chemical synthesis; sol-gel process; **ionic conduction**; proton; fuel cell; temperature dependence; heat resistance; **composite** film; impedance method(corrosion)
BT functional polymer; macromolecule; electrolyte; matter; polymer complex; complex(substance); chemical reaction; synthesis; electric conduction; electrical property; nucleon; baryon; hadron; elementary particle; chemical cell; battery; dependence; resistance(endure); membrane and film; electrochemical corrosion test; corrosion test; test

L63 ANSWER 18 OF 82 RAPRA COPYRIGHT 2002 RAPRA
AN R:847963 RAPRA FS Rapra Abstracts
TI EFFECTS OF alpha-Al2O3 ON THE **IONIC** TRANSPORT AND **CONDUCTIVITY** PROPERTIES OF POLY(BIS(METHOXYETHOXY)PHOSPHAZENE) BASED POLYMER ELECTROLYTES.
AU Chen-Yang Y W; Chen H C; Lin F L
CS Chung-Yuan,Christian University
SO Polymer Preprints. Volume 42. Number 2. Fall 2001. Proceedings of a conference held Chicago, Il., 7th-11th April 2002
Editor(s): ACS,Div.of Polymer Chemistry
Washington, D.C., ACS,Div.of Polymer Chemistry, 2001, p.46-7
PY 2001
DT Conference Article
LA English
AB Polyelectrolytes may be divided into three categories: dry **solid** -, gel- and **composite**-types. The dry **solid** type polymer electrolytes show lower **ionic conductivity**, but present less of an environmental hazard, while the gel-type polymer electrolytes have higher **ionic conductivities**, yet suffer a possible hazard due to the incorporated organic solvent. The **composite** type, a subset of the **solid** electrolytes, are usually called **composite polymer electrolytes** . Due to the presence of ceramic fillers, such as Al2O3, TiO2, etc., **composite polymer electrolytes** usually show higher **ionic conductivity**, better mechanical properties and electrolyte-metal electrode interfacial stability. The poly(bis(methoxyethoxyethoxy)phosphazene) (MEEP)/lithium salt electrolytes system shows higher conductivity than the corresponding PEO-lithium salt electrolyte system. However, poor mechanical stability is a shortcoming for practical application. Therefore, many efforts, which include crosslinking of MEEP, chemical crosslinking of MEEP with

polyethylene glycol, the 60 Co alpha irradiation of ether MEEP or MEEP-(LiX) 0.25 complexes, or the use of a porous glass fibre matrix to support MEEP, are utilised to solve this problem. A series of new **composite polymer electrolytes** based on MEEP/LiClO4 and alpha-Al2O3 are prepared. The conductivity measurements are coupled with DSC experiments and FT-IR measurements to investigate the interactions between polymer, salt and filler. Also discussed is the possible lithium ion transport mechanism in the MEEP **composite** electrolytes. 9 refs.

CC 6M; 98; 45D

SC *QM; UI; KX

CT ANALYSIS; DATA; DIFFERENTIAL SCANNING CALORIMETRY; DIFFERENTIAL THERMAL ANALYSIS; ELECTRICAL CONDUCTIVITY; ELECTRICAL PROPERTIES; ETHYLENE GLYCOL POLYMER; FOURIER TRANSFORM INFRARED SPECTROSCOPY; FTIR; FTIR SPECTROSCOPY; GRAPH; INSTITUTION; **IONIC CONDUCTIVITY**; IR SPECTROSCOPY; PHOSPHAZENE POLYMER; PLASTIC; POLYBISMETHOXYETHOXYETHOXYPHO SPHAZENE; POLYELECTROLYTE; POLYETHYLENE GLYCOL; POLYPHOSPHAZENE; PROPERTIES; TECHNICAL; THERMAL ANALYSIS; THERMOPLASTIC; THERMOSET

NPT LITHIUM

SHR POLYELECTROLYTES, electrical properties, phosphazene polymers; ELECTRICAL PROPERTIES, polyelectrolytes, **ionic conductivity**, phosphazene polymers; PHOSPHAZENE POLYMERS, polyelectrolytes, electrical properties

GT TAIWAN

L63 ANSWER 19 OF 82 JICST-EPlus COPYRIGHT 2002 JST

AN 1010803766 JICST-EPlus

TI Characteristic Investigation of **Polymer Electrolyte Membrane** Using Interdigitated Microarray Electrode.

AU UMEDA MINORU; OJIMA HIROYUKI; MOHAMEDI M; ITO TAKASHI; UCHIDA ISAMU

CS Tohoku Univ., Grad. Sch.

SO Nenryo Denchi Shinpojiumu Koen Yokoshu (FCDIC Fuel Cell Symposium Proceedings), (2001) vol. 8th, pp. 23-29. Journal Code: L2407A (Fig. 11, Ref. 11)

CY Japan

DT Conference; Article

LA Japanese

STA New

AB Studies have been performed on a **cast**-coated Nafion thin film combined with an interdigitated microarray electrode in order to elucidate its basic characteristics. According to the results of AC-conductivity measurement, relative humidity and temperature dependence of the conductivity is clearly observed. Some physical and chemical treatments, i.e., chemical activation, metal-ion exchange, heat and cool processes, influence the conductivity. Furthermore, current-voltage curves have been measured in water and/or methanol gas atmosphere. As a result, it was found, (i) that the structure of the as-prepared film was changed by methanol gas exposure, and (ii) that the film-coated electrode can well detect the water/methanol gas mixture after sufficient exposure to methanol gaseous. (author abst.)

CC YB04040V (621.352.6)

CT solid polyelecrolyte; ion exchange membrane; polymer membrane; cation exchange resin; microelectrode; characterization; current-voltage characteristic; fuel cell; polyelectrolyte; **ionic conduction**; proton

BT functional polymer; macromolecule; electrolyte; matter; solid electrolyte; ion exchanger(material); membrane and film; ion exchange resin; electrode; electrical characteristic; characteristic; chemical cell; battery; electric conduction; electrical property; nucleon; baryon; hadron; elementary particle

ST polymer electrolyte fuel cell; proton conduction

L63 ANSWER 20 OF 82 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
AN 2000:260778 HCAPLUS
DN 132:294808
TI **Composite solid polymer electrolyte membranes**
IN Formato, Richard M.; Kovar, Robert F.; Osenar, Paul; Landrau, Nelson; Rubin, Leslie S.
PA Foster-Miller, Inc., USA
SO PCT Int. Appl., 95 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 52
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000022684	A2	20000420	WO 1999-US19476	19990826
	WO 2000022684	A3	20000720		

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	WO 9910165	A1	19990304	WO 1998-US17898	19980828

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	US 6248469	B1	20010619	US 1999-261349	19990303
	CA 2342237	AA	20000420	CA 1999-2342237	19990826
	AU 2000023415	A5	20000501	AU 2000-23415	19990826
	EP 1116292	A2	20010718	EP 1999-967058	19990826

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	US 2002045085	A1	20020418	US 2000-750402	20001228
PRAI	WO 1998-US17898	W	19980828		
	US 1999-261349	A	19990303		
	US 1997-57233P	P	19970829		
	WO 1998-US178	W	19980828		
	WO 1999-US19476	W	19990826		

AB The present invention relates to **composite solid polymer electrolyte membranes (SPEMs**) which include a porous polymer substrate (typically a **liq. crystal polymer) interpenetrated** with an **ion-conducting** material (typically a **perfluorinated** ionomer). **SPEMs** of the present invention are useful in electrochem. applications, including fuel cells and electrodialysis.
ST **composite solid polymer electrolyte**

membrane; fuel cell **polymer electrolyte**
membrane; electrodialysis **polymer electrolyte**
membrane; **liq crystal polymer**
interpenetrating network electrolyte; **perfluorinated**
ionomer **interpenetrating** network electrolyte

IT Pervaporation
(app.; **composite solid polymer**
electrolyte membranes)

IT Polyamides, uses
Polyketones
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(arom.; **composite solid polymer**
electrolyte membranes)

IT Dialyzers
Electrolytic cells
Interpenetrating polymer networks
Liquid crystals, polymeric
Primary batteries
(**composite solid polymer**
electrolyte membranes)

IT Polybenzimidazoles
Polybenzothiazoles
Polybenzoxazoles
Polyimides, uses
Polyoxyphenylenes
Polyphenyls
Polysulfones, uses
Polythiophenylenes
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(**composite solid polymer**
electrolyte membranes)

IT Fuel cells
(direct methanol or hydrogen; **composite solid**
polymer electrolyte membranes)

IT Dialyzers
(electrodialyzers; **composite solid polymer**
electrolyte membranes)

IT Polyimides, uses
Polyimides, uses
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(fluorine-contg.; **composite solid polymer**
electrolyte membranes)

IT Ionomers
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(fluoropolymers; **composite solid polymer**
electrolyte membranes)

IT Fluoropolymers, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(ionomers; **composite solid polymer**
electrolyte membranes)

IT **Polymer electrolytes**
(**membrane**; **composite solid**
polymer electrolyte membranes)

IT Polyimides, uses

Polyimides, uses
Polyketones
Polyketones
Polysulfones, uses
Polysulfones, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polyether-; **composite solid polymer electrolyte membranes**)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(polyimide-; **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polyimide-; **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polyketone-; **composite solid polymer electrolyte membranes**)

IT Polyquinoxalines
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polyphenylquinoxalines; **composite solid polymer electrolyte membranes**)

IT Polysulfones, uses
Polysulfones, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polysulfide-, arom.; **composite solid polymer electrolyte membranes**)

IT Polysulfides
Polysulfides
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, arom.; **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(polysulfone-; **composite solid polymer electrolyte membranes**)

IT **Membranes**, nonbiological
(**solid polymer electrolyte; composite solid polymer electrolyte membranes**)

IT Plastics, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(thermoplastics; **composite solid polymer electrolyte membranes**)

IT Plastics, uses
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(thermosetting; **composite solid polymer electrolyte membranes**)

IT **25667-42-9DP**, sulfonated
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(Ultrason; **composite solid polymer electrolyte membranes**)

IT **25135-51-7DP**, Udel, sulfonated **25212-74-2DP**, PPS, sulfonated 63496-24-2P, Nafion EW1100 154281-38-6DP, Radel R, sulfonated **220998-11-8P**, 4,4'-(Hexafluoroisopropylidene)bis(phthalic anhydride-m-Phenylenediamine-sodium 2,4-diaminobenzenesulfonate copolymer
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(**composite solid polymer electrolyte membranes**)

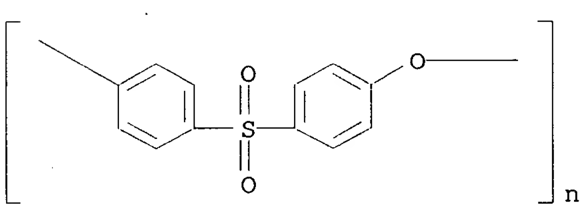
IT 88-63-1P, 2,4-Diaminobenzenesulfonic acid 3177-22-8P, Sodium 2,4-diaminobenzenesulfonate
RL: **IMF (Industrial manufacture)**; RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)
(**composite solid polymer electrolyte membranes**)

IT 9003-01-4, Polyacrylic acid **24938-64-5** **24938-67-8**, Poly[oxy(2,6-dimethyl-1,4-phenylene)] **24938-68-9**, 2,6-Diphenylphenol homopolymer, sru **25035-37-4**, p-Phenylenediamine-terephthalic acid copolymer **25134-01-4**, 2,6-Dimethylphenol homopolymer 26101-52-0, Polyvinyl sulfonic acid **26353-84-4**, 2,6-Diphenylphenol homopolymer 27754-99-0, Polyvinyl phosphonic acid **50851-57-5**, Polystyrene sulfonic acid **264624-35-3**, Trifluorostyrenesulfonic acid homopolymer
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(**composite solid polymer electrolyte membranes**)

IT **25667-42-9DP**, sulfonated
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(Ultrason; **composite solid polymer electrolyte membranes**)

RN 25667-42-9 HCAPLUS

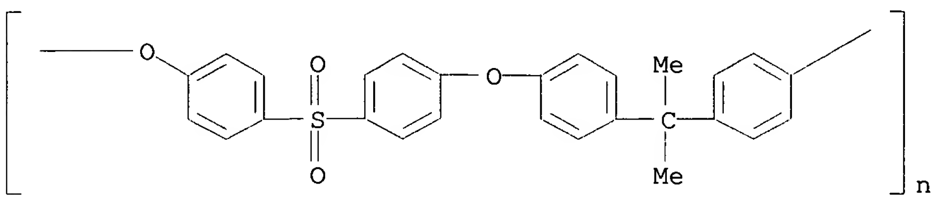
CN Poly(oxy-1,4-phenylenesulfonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



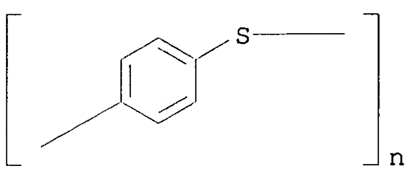
IT **25135-51-7DP**, Udel, sulfonated **25212-74-2DP**, PPS, sulfonated **220998-11-8P**, 4,4'-(Hexafluoroisopropylidene)bis(phth

alic anhydride-m-Phenylenediamine-sodium 2,4-diaminobenzenesulfonate copolymer
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(**composite solid polymer electrolyte membranes**)

RN 25135-51-7 HCAPLUS
CN Poly[oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene] (9CI) (CA INDEX NAME)



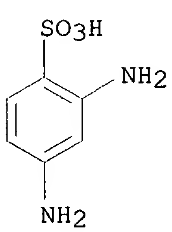
RN 25212-74-2 HCAPLUS
CN Poly(thio-1,4-phenylene) (9CI) (CA INDEX NAME)



RN 220998-11-8 HCAPLUS
CN Benzenesulfonic acid, 2,4-diamino-, monosodium salt, polymer with 1,3-benzenediamine and 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

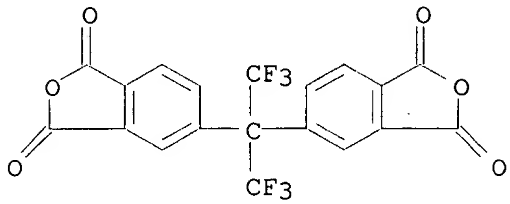
CRN 3177-22-8
CMF C6 H8 N2 O3 S . Na



Na

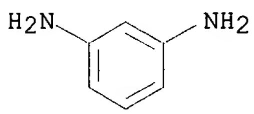
CM 2

CRN 1107-00-2
CMF C19 H6 F6 O6



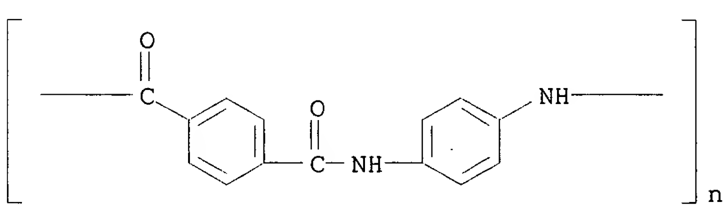
CM 3

CRN 108-45-2
CMF C6 H8 N2

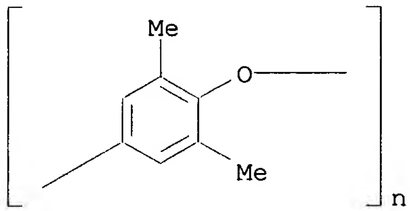


IT **24938-64-5** **24938-67-8**, Poly[oxy(2,6-dimethyl-1,4-phenylene)] **24938-68-9**, 2,6-Diphenylphenol homopolymer, sru **25035-37-4**, p-Phenylenediamine-terephthalic acid copolymer **25134-01-4**, 2,6-Dimethylphenol homopolymer **26353-84-4**, 2,6-Diphenylphenol homopolymer **50851-57-5**, Polystyrene sulfonic acid **264624-35-3**, Trifluorostyrenesulfonic acid homopolymer
RL: **POF (Polymer in formulation)**; TEM (Technical or engineered material use); USES (Uses)
(**composite solid polymer electrolyte membranes**)

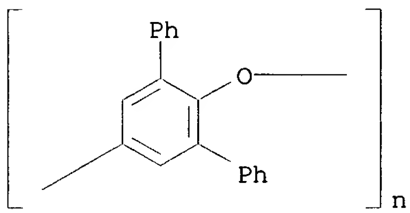
RN 24938-64-5 HCAPLUS
CN Poly(imino-1,4-phenyleneiminocarbonyl-1,4-phenylenecarbonyl) (9CI) (CA INDEX NAME)



RN 24938-67-8 HCAPLUS
CN Poly[oxy(2,6-dimethyl-1,4-phenylene)] (9CI) (CA INDEX NAME)



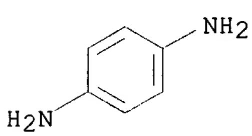
RN 24938-68-9 HCAPLUS
CN Poly(oxy[1,1':3',1''-terphenyl]-2',5'-diyl) (9CI) (CA INDEX NAME)



RN 25035-37-4 HCAPLUS
CN 1,4-Benzenedicarboxylic acid, polymer with 1,4-benzenediamine (9CI) (CA INDEX NAME)

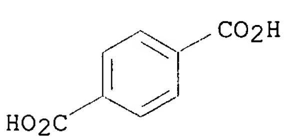
CM 1

CRN 106-50-3
CMF C6 H8 N2



CM 2

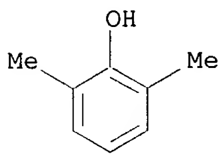
CRN 100-21-0
CMF C8 H6 O4



RN 25134-01-4 HCAPLUS
CN Phenol, 2,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

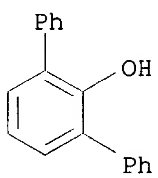
CRN 576-26-1
CMF C8 H10 O



RN 26353-84-4 HCAPLUS
CN [1,1':3',1''-Terphenyl]-2'-ol, homopolymer (9CI) (CA INDEX NAME)

CM 1

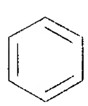
CRN 2432-11-3
CMF C18 H14 O



RN 50851-57-5 HCAPLUS
CN Benzenesulfonic acid, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 26914-43-2
CMF C8 H8 O3 S
CCI IDS



D1— CH═CH2

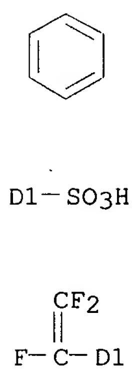
D1— SO3H

RN 264624-35-3 HCAPLUS
CN Benzenesulfonic acid, (trifluoroethenyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 66836-74-6

CMF C8 H5 F3 O3 S
CCI IDS



L63 ANSWER 21 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:790777 HCAPLUS
DN 133:337745
TI Electrochemical uses of amorphous fluoropolymers in fuel cells
IN Kumar, Sridhar; Rajendran, Govindarajulu
PA E.I. Du Pont De Nemours and Company, USA
SO PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M004-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000067336	A2	20001109	WO 2000-US10641	20000419
	WO 2000067336	A3	20020124		

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	BR 2000011217	A	20020319	BR 2000-11217	20000419
	EP 1194973	A2	20020410	EP 2000-926184	20000420

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

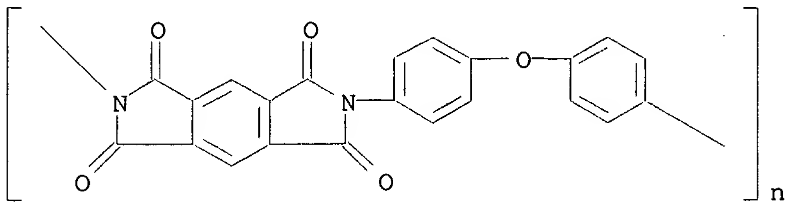
PRAI US 1999-131799P P 19990430
WO 2000-US10641 W 20000419

AB A method for forming a membrane electrode assembly comprises: forming a layered structure including .gtoreq.1 substantially fluorinated **solid polymer electrolyte membrane,** .gtoreq.1 catalyst layer contg. a catalyst and a substantially fluorinated ionomeric resin binder, and .gtoreq.1 fibrous carbon gas diffusion backing layer, wherein .gtoreq.1 of the layers further comprises an amorphous fluoropolymer; heating the layered structure to .ltorsim.200.degree.; and

applying pressure to the heated layered structure to produce a
consolidated membrane electrode assembly wherein the catalyst layer is in
ionically conductive contact with the **solid**
polymer electrolyte, and the gas diffusion backing layer is in
electronically conductive contact with the catalyst layer. The membrane
electrode assembly is durable, uniform and possesses good structural
integrity, produced by a method that avoids a long, complicated sintering
of the fluoropolymers incorporated at undesirably high temps.

ST fuel cell amorphous fluoropolymer application
IT Catalysts
(electrocatalysts; electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Fuel cells
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(fluorine- and sulfo-contg., ionomers; electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(fluorine-contg., sulfo-contg., ionomers; electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Fluoropolymers, uses
Fluoropolymers, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, sulfo-contg., ionomers; electrochem. uses of amorphous fluoropolymers in fuel cells)
IT Ionomers
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg.; electrochem. uses of amorphous fluoropolymers in fuel cells)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT 37626-13-4, Teflon af 1601 204270-08-6, Perfluoroethyl vinyl ether-perfluoromethyl vinyl ether-tetrafluoroethylene copolymer
303224-97-7, Nafion N 112
RL: DEV (Device component use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT 9002-84-0, Ptfe **25036-53-7**, Kapton
RL: TEM (Technical or engineered material use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
IT **25036-53-7**, Kapton
RL: TEM (Technical or engineered material use); USES (Uses)
(electrochem. uses of amorphous fluoropolymers in fuel cells)
RN 25036-53-7 HCAPLUS

CN Poly[(5,7-dihydro-1,3,5,7-tetraoxobenzo[1,2-c:4,5-c']dipyrrole-2,6(1H,3H)-diyl)-1,4-phenyleneoxy-1,4-phenylene] (9CI) (CA INDEX NAME)



L63 ANSWER 22 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:191397 HCAPLUS
DN 132:224816
TI Polymer-based hydroxide conducting membranes
IN Yao, Wayne; Tsai, Tsepin; Chang, Yuen-ming; Chen, Muguo
PA Reveo, Inc., USA
SO PCT Int. Appl., 27 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M006-18
ICS H01M008-10; H01M010-26
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000016422	A1	20000323	WO 1999-US20404	19990907
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6183914	B1	20010206	US 1998-156135	19980917
	CA 2344148	AA	20000323	CA 1999-2344148	19990907
	AU 9961372	A1	20000403	AU 1999-61372	19990907
	AU 743088	B2	20020117		
	EP 1116291	A1	20010718	EP 1999-948135	19990907
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	BR 9913832	A	20011218	BR 1999-13832	19990907
	JP 2002525803	T2	20020813	JP 2000-570855	19990907
	TW 463413	B	20011111	TW 1999-88116173	19990917
PRAI	US 1998-156135	A	19980917		
	WO 1999-US20404	W	19990907		

AB A **polymer**-based **electrolyte compn.** having excellent film-forming properties, flexibility, mech. strength and high hydroxide cond. is disclosed. The compn. comprises an org. polymer having an alkyl quaternary ammonium salt structure; a nitrogen-contg., heterocyclic quaternary ammonium salt; and a metal hydroxide salt. In a preferred embodiment, the compn. is **cast** in the form of a film that is suitable for use as an **ion-conducting** or other

specialty membrane in a power source, such as for example an alk. battery or fuel cell, that relies on hydroxide anion transport for its operation.
ST battery polymer based hydroxide conducting membrane; fuel cell polymer based hydroxide conducting membrane
IT Quaternary ammonium compounds, uses
RL: DEV (Device component use); USES (Uses)
(alkyl; polymer-based hydroxide conducting **membranes**)
IT Quaternary ammonium compounds, uses
RL: DEV (Device component use); USES (Uses)
(nitrogen-contg., heterocyclic; polymer-based hydroxide conducting **membranes**)
IT Battery electrolytes
Fuel cell electrolytes
Membranes, nonbiological
Polymer electrolytes
(polymer-based hydroxide conducting **membranes**)
IT Primary batteries
(zinc-air; polymer-based hydroxide conducting **membranes**)
IT 75-59-2, Tetramethylammonium hydroxide 77-98-5, Tetraethylammonium hydroxide 1310-58-3, Potassium hydroxide, uses 260974-68-3, Amberlite OH
RL: DEV (Device component use); USES (Uses)
(polymer-based hydroxide conducting **membranes**)
IT 874-81-7, N-Butylpyridinium iodide 21645-51-2, Aluminum hydroxide, uses 26062-79-3
RL: DEV (Device component use); USES (Uses)
(polymer-based hydroxide conducting **membranes** made of mixt. contg.)
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(2) Kenichi, T; US 5643490 A 1997 HCAPLUS
(3) Nippon Telegr & Teleph Corp; JP 55062661 A 1980 HCAPLUS
(4) Secr Defence Brit; WO 9811619 A 1998 HCAPLUS

L63 ANSWER 23 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:643411 HCAPLUS
DN 133:210712
TI **Solid polymer electrolyte membranes** and fuel cells using the membranes
IN Okada, Tatsuhiro; Sun, Lixian; Dahl, Jurgen; Mitsuda, Norio
PA Agency for Industrial Science and Technology, Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000251906	A2	20000914	JP 1999-52501	19990301

AB The electrolyte membranes have a cation exchanger film and an anion exchanger film joined together by hot pressing, mixing, **casting**, blending, copolymn, or other methods. The cation exchanger film is preferably a **perfluorocarbon** sulfonic acid film, and the anion exchanger film a poly(o-phenylenediamine) film. The fuel cells have the electrolyte membrane between a cathode and an anode.
ST fuel cell electrolyte cation anion exchanger membrane; **perfluorocarbon** sulfonic acid membrane laminate fuel cell

electrolyte; polyphenylenediamine membrane laminate fuel cell electrolyte
IT Fuel cell electrolytes
(electrolyte **membranes** contg. cation and anion exchangers for fuel cells)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-contg., ionomers; electrolyte **membranes** contg. cation and anion exchangers for fuel cells)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine-contg., sulfo-contg., ionomers; electrolyte **membranes** contg. cation and anion exchangers for fuel cells)
IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-contg., ionomers; electrolyte **membranes** contg. cation and anion exchangers for fuel cells)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg.; electrolyte **membranes** contg. cation and anion exchangers for fuel cells)
IT 25667-98-5, Poly(o-phenylenediamine)
RL: DEV (Device component use); USES (Uses)
(electrolyte **membranes** contg. cation and anion exchangers for fuel cells)

L63 ANSWER 24 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 2000-303105 [26] WPIX
DNN N2000-226518 DNC C2000-091836
TI Homogeneous solid polymer alloy electrolyte and **composite** electrode for use in lithium polymer or lithium ion polymer battery.
DC A14 A85 E17 L03 X16
IN CHO, B W; CHO, W I; KIM, H S; KIM, U S; PAIK, C H; YUN, K S; BAEK, J H; KIM, W S; YOON, G S
PA (KANK-N) KANKOKU KAGAKU GIJUTSU KENKYUIN; (KOAD) KOREA ADV INST SCI & TECHNOLOGY
CYC 83
PI WO 2000016421 A1 20000323 (200026)* EN 54p H01M006-18
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS KE KG KP KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW
JP 2000090728 A 20000331 (200027) 19p H01B001-06
AU 9916951 A 20000403 (200034) H01M006-18
JP 3085532 B2 20000911 (200046) 19p H01B001-06
KR 2000019372 A 20000406 (200104) H01M010-38
EP 1114481 A1 20010711 (200140) EN H01M006-18
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
CN 1315061 A 20010926 (200206) H01M006-18
US 6355380 B1 20020312 (200221) H01M010-40
ADT WO 2000016421 A1 WO 1998-KR494 19981231; JP 2000090728 A JP 1999-46527 19990224; AU 9916951 A AU 1999-16951 19981231; JP 3085532 B2 JP 1999-46527 19990224; KR 2000019372 A KR 1998-37423 19980910; EP 1114481 A1 EP 1998-961686 19981231, WO 1998-KR494 19981231; CN 1315061 A CN 1998-814258 19981231; US 6355380 B1 US 1999-231442 19990114
FDT AU 9916951 A Based on WO 200016421; JP 3085532 B2 Previous Publ. JP 2000090728; EP 1114481 A1 Based on WO 200016421
PRAI KR 1998-37423 19980910

IC ICM H01B001-06; H01M006-18; H01M010-38; H01M010-40
ICS H01M004-02; H01M004-04; H01M004-62; H01M006-22

AB WO 200016421 A UPAB: 20000531
NOVELTY - A solid polymer alloy electrolyte comprises a mixture of polyacrylonitrile, poly(methyl methacrylate), polyvinylidene fluoride and poly(vinylchloride) based polymers.

DETAILED DESCRIPTION - A solid polymer alloy electrolyte(I) comprises (wt.%):

(a) function-I polymers (5 - 90) which contain one of polyacrylonitrile (PAN) or poly(methyl methacrylate) (PMMA) based solid polymers having superior adhesion and **ion conductivity** ;

(b) function-II polymers (5 - 80) which contain one of polyvinylidene fluoride (PVdF) or PMMA-based solid polymers, having superior compatibility with an organic solvent electrolyte; and

(c) function-III polymers (5 - 80) which contain one of poly(vinylchloride) or PVdF-based solid polymers, having superior mechanical strength.

INDEPENDENT CLAIMS are also included for:

(A) manufacturing (1) in a homogeneous state, which comprises:

(i) mixing (a), (b) and (c), a plasticizer with one to five times the weight of solid polymer mixture, an organic solvent with one to five times the weight of the mixture, one of SiO2 and Al2O3 (0 - 20 wt.%);

(ii) forming a matrix of the mixture by heating it between 100 - 180 deg. C and blending for 10 - 120 minutes; and

(iii) **casting** the mixture into (I);

(B) a **composite** anode(II) which comprises (wt.%): (I) (15 - 25), an anode active material (25 - 35), a conductive material(0.5 - 2), and a plasticizer (balance);

(C) a **composite** cathode(III) which comprises (wt.%): (I) (15 - 25), a cathode active material (25 - 35), a conductive material (0.5 - 2), and a plasticizer (balance);

(D) a lithium polymer battery which comprises: a stacked structure which contains stacked layers in the order of (II), (I), (III) and (I), with the terminals respectively connected to the (II) and (III), and surrounded by a battery casing. The stacked structure is sealed;

(E) manufacturing of a lithium polymer battery which comprises: (1) forming a structure by bonding (I) to both sides of an anode which comprises one or more materials of a lithium, a lithium alloy and (II) using a lamination process, and cutting the structure in a predetermined size; (2) forming a stacked structure by alternatively-stacking (III) and the cut structure of step (1). (III) is cut in smaller size as compared to structure in step (1); and (3) connecting terminals respectively to the anode and cathode of the stacked structure and inserting the stacked structure into a battery casing;

(F) a lithium ion polymer battery which comprises: a stacked structure which contains stacked layers in the order of an anode, (I), cathode, and (I), and an organic solvent electrolyte injected to the stacked structure with the terminals respectively connected to the anode and cathode, and surrounded by a battery casing. The stacked structure is sealed. The anode and cathode are of conventional type; and

(G) manufacturing a lithium ion polymer battery which comprises:

(i) forming a structure by bonding (I) to both sides of the anode using a lamination process, and cutting the structure in a predetermined size;

(ii) forming a stacked structure by alternatively-stacking a cathode and the cut structure of step (q). The cathode is cut in smaller size as compared to structure in step (q);

(iii) connecting terminals respectively to the anode and cathode of the stacked structure and inserting the stacked structure into a battery

casing; and
(iv) injecting an organic solvent electrolyte to the stacked structure and vacuum-sealing the structure.
USE - As an electrolyte in lithium polymer battery and lithium ion polymer battery. The battery can be used in industrial fields such as compact electronic appliances, communication devices and power source for electric vehicles.
ADVANTAGE - The polymer alloy electrolyte has superior properties such as **ion conductivity**, adhesion to the electrode, compatibility with an organic solvent electrolyte and mechanical strength. The lithium polymer battery has an excellent energy density, cycle life, low and high temperature and high-rate discharge characteristics.
Dwg.0/8

FS CPI EPI
FA AB; DCN
MC CPI: A04-D02; A04-E02E1; A04-E03E; A04-E10B; A04-F06E; A07-A02B; A08-P01; A11-B04; A11-B09A; A11-C01C; A12-E06A; E07-A04; E10-A11B2; E10-A15F; E10-D03C; E31-P03; E33-G; E34-C02; L03-E01C
EPI: X16-A02A; X16-B01F1; X16-J01A; X16-J08

L63 ANSWER 25 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:397514 HCAPLUS
DN 133:91904
TI Sulfonated polysulfone as promising **membranes** for **polymer electrolyte** fuel cells
AU Lufrano, F.; Squadrito, G.; Patti, A.; Passalacqua, E.
CS CNR-ITAE, Institute for Transformation and Storage of Energy, Messina, 98126, Italy
SO Journal of Applied Polymer Science (2000), 77(6), 1250-1257
CODEN: JAPNAB; ISSN: 0021-8995
PB John Wiley & Sons, Inc.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**, 76
AB A new, milder sulfonation process was used to produce ion-exchange polymers from a com. polysulfone (PSU). Membranes obtained from the sulfonated polysulfone are potential substitutes for perfluorosulfonic acid membranes used now in polymer electrolyte fuel cells. Sulfonation levels from 20 to 50% were easily achieved by varying the content of the sulfonating agent and the reaction time. Ion-exchange capacities from 0.5 to 1.2 mmol SO3H/g polymer were found via elemental anal. and titrn. Proton conductivities between 10-6 and 10-2 S cm-1 were measured at room temp. An increase in intrinsic viscosity with increasing sulfonation degree confirms that the sulfonation process helps to preserve the polymer chain from degrdn. Thermal anal. of the sulfonated polysulfone (SPSU) samples reveals higher glass transition temps. and lower decompn. temps. with respect to the unsulfonated sample (PSU). Amorphous structures for both PSU and SPSU membranes were detected by X-ray diffraction anal. and differential scanning calorimetry. Preliminary tests in fuel cells have shown encouraging results in terms of cell performance.
ST **polymer electrolyte** fuel cell **membrane**; sulfonated polysulfone membrane fuel cell
IT **Ionic conductivity**
(proton; sulfonated polysulfone as promising **membranes** for **polymer electrolyte** fuel cells)
IT Fuel cell electrolytes
Solid state fuel cells
(sulfonated polysulfone as promising **membranes** for **polymer electrolyte** fuel cells)

IT Sulfonation
(with trimethylsilyl chlorosulfonate; sulfonated polysulfone as promising **membranes** for **polymer electrolyte** fuel cells)
IT **25135-51-7D**, Udel, sulfonated
RL: DEV (Device component use); USES (Uses)
(sulfonated polysulfone as promising **membranes** for **polymer electrolyte** fuel cells)
RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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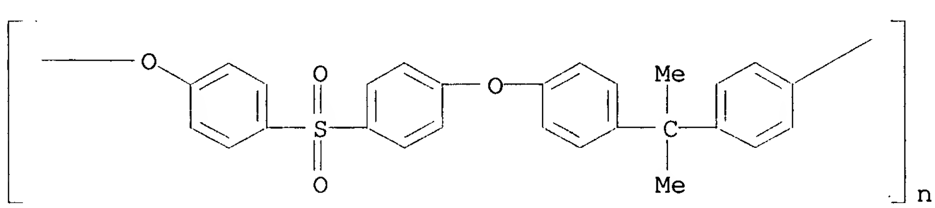
IT **25135-51-7D**, Udel, sulfonated
RL: DEV (Device component use); USES (Uses)
(sulfonated polysulfone as promising **membranes** for **polymer electrolyte** fuel cells)
RN 25135-51-7 HCAPLUS
CN Poly[oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene] (9CI) (CA INDEX NAME)



L63 ANSWER 26 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:83099 HCAPLUS
DN 135:21862
TI Characteristics of **composite polymer electrolytes** based on poly(ethylene oxide) and inorganic fiber
AU Wen, Z. Y.; Lin, Z. X.; Cao, J. D.; Itoh, T.; Yamamoto, O.
CS Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, 200050, Peop. Rep. China
SO Solid State Ionics: Materials and Devices, [Proceedings of the Asian Conference], 7th, Fuzhou, China, Oct. 29-Nov. 4, 2000 (2000), 395-399. Editor(s): Chowdari, B. V. R.; Wang, Wenji. Publisher: World Scientific Publishing Co. Pte. Ltd., Singapore, Singapore.
CODEN: 69AWLC
DT Conference
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
AB **Composite polymer electrolytes** based on alumina fiber and (PEO)8-LiClO4 were prepd. by solvent **casting** technique. SEM anal. indicated that fibers homogeneously distributed in PEO matrix and effectively prevent the formation of microcracks in the **composite polymer electrolytes** while they were quenched from higher temps. Complex impedance results demonstrated the effectiveness of the additives on the **ionic cond.** of the **composite polymer electrolytes**. Total **ionic cond.** as high as 6.5.times.10-4 Scm-1 at 80.degree. was obtained for the **composited polymer electrolyte** with 20% alumina fiber. Thermal creep performances of the PEO based polymer electrolytes were also improved remarkably, esp. at higher temps.
ST polymer electrolyte polyethylene oxide alumina fiber; **ionic cond** polyethylene oxide alumina fiber electrolyte
IT Synthetic fibers
RL: DEV (Device component use); MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(aluminum oxide; characteristics of polymer electrolytes based on poly(ethylene oxide) and alumina fiber)
IT Creep
Ionic conductivity
Microcrack
Polymer electrolytes
(characteristics of polymer electrolytes based on poly(ethylene oxide) and alumina fiber)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)
(characteristics of polymer electrolytes based on poly(ethylene oxide) and alumina fiber)
IT Polymer morphology
(surface; characteristics of polymer electrolytes based on poly(ethylene oxide) and alumina fiber)
IT 7791-03-9, Lithium perchlorate
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(characteristics of polymer electrolytes based on poly(ethylene oxide) and alumina fiber)
IT 25322-68-3, Poly(ethylene oxide)
RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)

(characteristics of polymer electrolytes based on poly(ethylene oxide) and alumina fiber)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Abraham, K; J Electrochem Soc 2000, V147, P1251 HCAPLUS
(2) Appetecchi, G; J Electrochem Soc 1998, V145, P4126 HCAPLUS
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(7) Wiecworeck, W; Proceedings of the second International Symposium on Polymer Electrolyte (ISPE2) 1990, P339

L63 ANSWER 27 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 1000534889 JICST-EPlus
TI Preparation of Zeolite and **Polymer Composite Electrolyte Membrane** for Direct Methanol Fuel Cells.
AU TAKAMI MASANOBU; YAMAZAKI YOTARO
HAMADA HIDEAKI
CS Tokyo Inst. of Technol.
National Inst. Materials and Chemical Res.
SO Nenryo Denchi Shinpojiumu Koen Yokoshu (FCDIC Fuel Cell Symposium Proceedings), (2000) vol. 7th, pp. 267-271. Journal Code: L2407A (Fig. 9, Tbl. 1, Ref. 1)
CY Japan
DT Conference; Article
LA Japanese
STA New
AB Thin and flexible zeolite and hydrated styrene butadiene rubber (HSBR) **composite** membranes with various **ion conductivity** were fabricated by **casting** method. The **composite** membranes consist of multivalent cation exchanged Y-type zeolites or various types of proton substituted zeolites. The acid sites where ammonia adsorbed weekly or strongly on zeolite were discussed by the ammonia TPD method. The relationship between the **solid** acidity of the zeolites and the **ion conductivity** of the **composite** membranes were evaluated. The **ion conductivity** of the multivalent cation exchanged Y-type zeolite **composites** was highly affected by the amount of the week acid sites. The **ion conductivity** of the proton substituted zeolite **composite** membrane was proportional to the amount of the Bronsted acid sites which was estimated by the pyridine-IR method. The HSBR **composite** membrane (80wt.%) containing Ca2+ exchanged Y-type zeolite particles gave the highest **ion conductivity** of 6*10-5S/cm in R.H. 100% at room temperature. The methanol permeability and the heat durability of the multivalent cation exchanged Y-type zeolite **composite** membranes were highly improved comparing with Nafion 117 films. (author abst.)
CC YB04040V (621.352.6)
CT liquid fuel cell; electrolyte; **composite** material; synthetic zeolite; macromolecule; hydrogenated polymer; membrane permeability; **ionic conduction**; electrical conductivity; **solid** acid; separator(plate); SBR
BT fuel cell; chemical cell; battery; matter; material; polymer; osmosis; transmission(propagation); electric conduction; electrical property; ratio; transport coefficient; coefficient; acid; plate classified by application; plate(material); synthetic rubber; rubber; butadiene-styrene copolymer; copolymer
ST HSBR

L63 ANSWER 28 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 1010919356 JICST-EPlus
TI Fabrications and Properties of **Composite Solid**-State Electrolytes.
AU INADA TARO; TAKADA KAZUNORI; KAJIYAMA AKIHISA; KOGUCHI MASARU; KONDO SHIGEO; WATANABE MAMORU
CS National Inst. Res. in Inorganic Materials
SO Kotai Ionikusu Toronkai Koen Yoshishu (Extended Abstracts. Symposium on Solid State Ionics in Japan), (2000) vol. 26th, pp. 114-115. Journal Code: L1398A (Fig. 2)
CY Japan
DT Conference; Short Communication
LA Japanese
STA New
AB Inorganic lithium **ion conductive solid** electrolytes are a fundamental solution for the safety problem of lithium batteries with flammable electrolytes. Their poor processibility, however, hinders their practical applications. We tried to improve the processibility of a lithium **ion conductive** glass by being **composite** with **polymers**. A **composite electrolyte** of the glass and polystyrene was successfully self-standing and showed high **ionic conductivity** of 8*10-4S/cm, which was comparable to the glass itself. (author abst.)
CC BL06021L (539.219.3)
CT **ionic conduction**; superionic conductor; polystyrene; **composite** material; glass; electrical conductivity; activation energy; lithium phosphate; sulfide(chalcogenide); silicon compound; electrochemical impedance
BT electric conduction; electrical property; **solid** electrolyte; electrolyte; matter; polymer; thermoplastic; plastic; material; ceramics; ratio; transport coefficient; coefficient; energy; lithium compound; alkali metal compound; phosphate(salt); phosphorus oxoate; oxoate; oxygen compound; oxygen group element compound; phosphorus compound; nitrogen group element compound; sulfur compound; chalcogenide; carbon group element compound; impedance

L63 ANSWER 29 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 1010919334 JICST-EPlus
TI Protonic Conductivity Properties of Stabilized Acidic Inorganic Complex in Polymer Membranes(I).
AU NAKAJIMA HITOSHI; HONMA ITARU
CS Electrotechnical Lab.
SO Kotai Ionikusu Toronkai Koen Yoshishu (Extended Abstracts. Symposium on Solid State Ionics in Japan), (2000) vol. 26th, pp. 64-65. Journal Code: L1398A (Fig. 2)
CY Japan
DT Conference; Short Communication
LA Japanese
STA New
AB New family of proton conducting organic/inorganic hybrid **polymer electrolyte membrane** was prepared by sol-gel processes. The method involves stabilization of metastable acidic tungsten oxide cluster in the polymer **composite** membrane. Homogeneous acidic solution of **solid** oxide was prepared by the method of dissolving tungstic acid in 30% hydrogen peroxide aqueous solution. This solution was added to the methanol solution of alchoxysillilated polyethyleneoxide600 and polymerized by sol-gel process, and homogeneous and transparent membrane was obtained. Metastable acidic moisties including tungsten peroxide cluster have not usually obtained in protonic **solid** form, however, those were stabilized in polymer complex membrane. The

membrane exhibited high protonic condictivity in excess of 10-3S cm-1 from RT to 140.DEG.C. under humidified condition. (author abst.)

CC CG02024U; BL06021L (544.23-16:535/538; 539.219.3)

CT **solid** acid; **ionic conduction**; sol-gel process; tungstic acid; polyethylene oxide; stretching vibration(molecule); electrical conductivity; cluster; polytetramethylene oxide; silylation; peroxo complex; proton; membrane and film; transparent material

BT acid; electric conduction; electrical property; oxyacid; oxygen compound; oxygen group element compound; tungsten compound; 6A group element compound; transition metal compound; polyalkylene oxide; thermoplastic; plastic; polyether; polymer; molecular vibration; oscillation; molecular motion; motion; ratio; transport coefficient; coefficient; substitution reaction; exchange reaction; chemical reaction; peroxide(inorganic); oxide; chalcogenide; complex(compound); coordination compound; compound(chemical); nucleon; baryon; hadron; elementary particle; material

ST proton conduction; transparent conductive film

L63 ANSWER 30 OF 82 HCAPLUS COPYRIGHT 2002 ACS

AN 2000:486838 HCAPLUS

DN 133:153103

TI Characterization of **composite** electrolytes based on a hyperbranched polymer

AU Wen, Z.; Itoh, T.; Ikeda, M.; Hirata, N.; Kubo, M.; Yamamoto, O.

CS Faculty of Engineering, Department of Chemistry for Materials, Mie University, Tsu, Mie, 514-8507, Japan

SO Journal of Power Sources (2000), 90(1), 20-26
CODEN: JPSODZ; ISSN: 0378-7753

PB Elsevier Science S.A.

DT Journal

LA English

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**

AB **Composite polymer electrolytes** composed of a hyperbranched poly[bis(triethylene glycol)benzoate] with terminal acetyl groups, LiN(CF3SO2)2 as a lithium salt, and an inert ceramic filler such as .alpha.-LiAlO2 or .gamma.-LiAlO2 were prepd. by solvent **casting** method. Addn. of an appropriate amt. of the fillers to fully amorphous pristine polymer electrolytes led to an increase in **ionic conductivities** and lithium **ion** transference nos. All **composite polymer electrolytes** exhibited good compatibility with a lithium metal electrode, and also, addn. of fillers improved their mech. performance. The .alpha.-LiAlO2 filler was effective for improving the electrochem. compatibility with a lithium metal electrode, and the .gamma.-LiAlO2 filler was effective for enhancing the mech. properties of the pristine polymer electrolytes.

ST battery electrolyte hyperbranched polymer; ceramic filler hyperbranched polymer battery electrolyte

IT Battery electrolytes
Electric conductivity
Polymer electrolytes
(characterization of **composite** electrolytes based on hyperbranched polymer)

IT 7791-03-9, Lithium perchlorate 12003-67-7, Aluminum lithium oxide allio2 14283-07-9, Lithium tetrafluoroborate 90076-65-6 **239798-54-0**
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(characterization of **composite** electrolytes based on hyperbranched polymer)

RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
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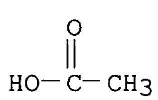
(20) Tammann, V; Anorg Allg Chem 1926, V156, P245
(21) Vogel, H; Phys Z 1921, V22, P645 HCAPLUS
(22) Weston, J; Solid State Ionics 1982, V7, P75 HCAPLUS
(23) Wiecworeck, W; Proceedings of the Second International Symposium on Polymer Electrolytes 1990, P339

IT **239798-54-0**
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(characterization of **composite** electrolytes based on hyperbranched polymer)
RN 239798-54-0 HCAPLUS
CN Benzoic acid, 3,5-bis[2-[2-(2-hydroxyethoxy)ethoxy]ethoxy]-, homopolymer, acetate (9CI) (CA INDEX NAME)

CM 1

CRN 64-19-7
CMF C2 H4 O2

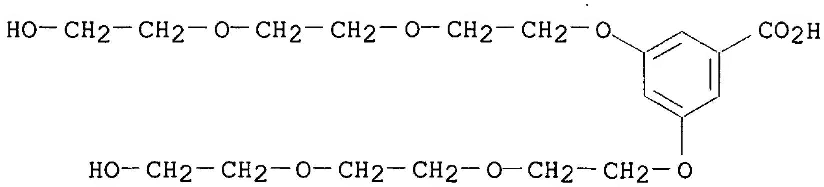


CM 2

CRN 239798-53-9
CMF (C19 H30 O10)x
CCI PMS

CM 3

CRN 239798-52-8
CMF C19 H30 O10



L63 ANSWER 31 OF 82 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 2 applicants
AN 1999:166547 HCAPLUS
DN 130:224121
TI **Composite solid polymer electrolyte membranes** and **casting** or **extrusion** of a **composite** membrane
IN Formato, Richard M.; Kovar, Robert F.; Osenar, Paul; Landrau, Nelson
PA Foster-Miller, Inc., USA
SO PCT Int. Appl., 70 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM B32B003-26
ICS B01D021-28; B01D024-00; B05D005-00; H01M008-10
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 52, 66, 72
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9910165	A1	19990304	WO 1998-US17898	19980828
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	CA 2300934	AA	19990304	CA 1998-2300934	19980828
	AU 9892101	A1	19990316	AU 1998-92101	19980828
	EP 1021296	A1	20000726	EP 1998-944594	19980828
	R: DE, FR, GB, IT, SE				
	JP 2001514431	T2	20010911	JP 2000-507525	19980828
	US 6248469	B1	20010619	US 1999-261349	19990303
	CA 2342237	AA	20000420	CA 1999-2342237	19990826
	WO 2000022684	A2	20000420	WO 1999-US19476	19990826
	WO 2000022684	A3	20000720		
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	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 2000023415	A5	20000501	AU 2000-23415	19990826
	CA 2342221	AA	20000504	CA 1999-2342221	19990826
	WO 2000024796	A1	20000504	WO 1999-US19470	19990826
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG,				

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          NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,
          UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
      RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
          ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG,
          CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
     EP 1115769        A1    20010718      EP 1999-965719   19990826
      R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
          IE, SI, LT, LV, FI, RO
     US 2002045085     A1    20020418      US 2000-750402   20001228
PRAI US 1997-57233P    P     19970829
     WO 1998-US17898   W     19980828
     US 1999-261349    A     19990303
     US 1999-262861    A     19990303
     WO 1999-US19470   W     19990826
     WO 1999-US19476   W     19990826
```

AB **Composite solid polymer electrolyte membranes** (**SPEMs**) include a porous polymer substrate **interpenetrated** with an **ion-conducting** material. The **SPEMs** are useful in electrochem. applications, including fuel cells, electrode separators, and electrodialysis. Thus, polybenzoxazole substrate film (solvent exchanged into NMP) was added to 5% soln. contg. sulfonated (75%) Radel R (I) and after 12 h placed into 20% soln. of sulfonated I, and the **composite** film isolated, stretched, dried, and solvent extd. to give a film having resistance 0.056 .OMEGA.-cm2; vs. 0.203 for a Nafion 117 control film.

ST **ion conducting** material **composite** electrolyte membrane; porous polybenzoxazole film **composite** electrolyte membrane; fuel cell **composite** electrolyte membrane; electrodialysis **composite** electrolyte membrane; sulfonated polyether sulfone **composite** electrolyte membrane

IT Polyamides, uses
Polyketones
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(arom.; in **composite solid polymer electrolyte membranes**)

IT Heat-resistant materials
Membranes, nonbiological
(blend of porous polymer substrate and **ion conducting** material; **composite solid polymer electrolyte membranes** with low resistance, good strength and heat resistance)

IT Polymer blends
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blend of porous polymer substrate and **ion conducting** material; **composite solid polymer electrolyte membranes** with low resistance, good strength and heat resistance)

IT Fuel cells
(**composite solid polymer electrolyte membranes** with low resistance, good strength and heat resistance)

IT Primary batteries
(electrode separators; **composite solid polymer electrolyte membranes** with low resistance, good strength and heat resistance)

IT Dialyzers
(electrodialyzers; **composite solid polymer**

electrolyte membranes with low resistance, good strength and heat resistance)

IT **Liquid crystals, polymeric**
(in **composite solid polymer electrolyte membranes**)

IT Polybenzimidazoles
Polybenzothiazoles
Polybenzoxazoles
Polyimides, uses
Polyoxyphenylenes
Polysulfones, uses
Polythiophenylenes
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(in **composite solid polymer electrolyte membranes**)

IT Polysulfones, uses
Polysulfones, uses
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyether-, arom.; in **composite solid polymer electrolyte membranes**)

IT Polyimides, uses
Polyimides, uses
Polyketones
Polyketones
Polysulfones, uses
Polysulfones, uses
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyether-; in **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyimide-; in **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyketone-; in **composite solid polymer electrolyte membranes**)

IT Polyquinoxalines
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polyphenylquinoxalines; in **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, arom.; in **composite solid polymer electrolyte membranes**)

IT Polyethers, uses
Polyethers, uses
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(polysulfone-; in **composite solid polymer**

electrolyte membranes)

IT **220998-11-8P**, 6FDA-1,3-phenylenediamine-sodium 2,4-diaminobenzenesulfonate copolymer
RL: **IMF (Industrial manufacture)**; RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)
(imidized, sulfonated; in **composite solid polymer electrolyte membranes**)

IT **25135-51-7DP**, Udel, sulfonated **25667-42-9DP**, Ultrason E, sulfonated **27380-27-4DP**, Victrex pek, sulfonated 154281-38-6DP, Radel R, sulfonated, sodium salts
RL: **IMF (Industrial manufacture)**; **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(in **composite solid polymer electrolyte membranes**)

IT **220998-11-8DP**, sulfonated
RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(in **composite solid polymer electrolyte membranes**)

IT **24938-64-5**, p-Phenylenediamine-terephthalic acid copolymer, sru **25035-37-4**, p-Phenylenediamine-terephthalic acid copolymer **25190-62-9**, Poly(1,4-phenylene) **27028-97-3**, Polyphenylene sulfide sulfone **31694-16-3**, PEEK 63496-24-2, Nafion ew 1100
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(in **composite solid polymer electrolyte membranes**)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Bahar; US 5547551 A 1996 HCAPLUS
(2) Bahar; US 5599614 A 1997 HCAPLUS
(3) Wei; US 5422411 A 1995 HCAPLUS

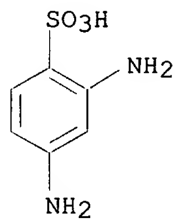
IT **220998-11-8P**, 6FDA-1,3-phenylenediamine-sodium 2,4-diaminobenzenesulfonate copolymer
RL: **IMF (Industrial manufacture)**; RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)
(imidized, sulfonated; in **composite solid polymer electrolyte membranes**)

RN 220998-11-8 HCAPLUS

CN Benzenesulfonic acid, 2,4-diamino-, monosodium salt, polymer with 1,3-benzenediamine and 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

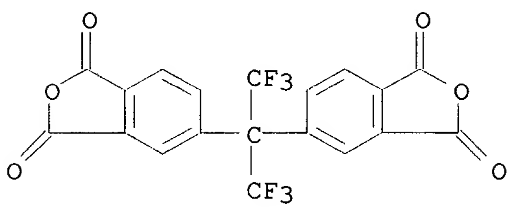
CRN 3177-22-8
CMF C6 H8 N2 O3 S . Na



● Na

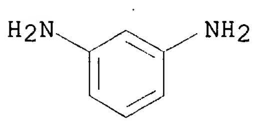
CM 2

CRN 1107-00-2
CMF C19 H6 F6 O6

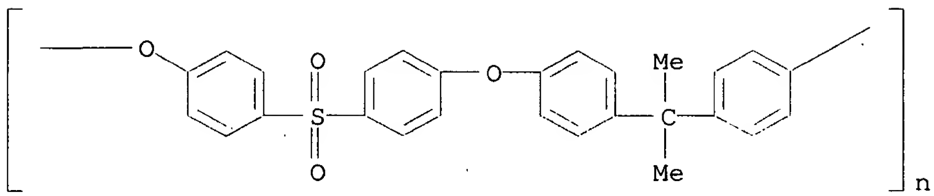


CM 3

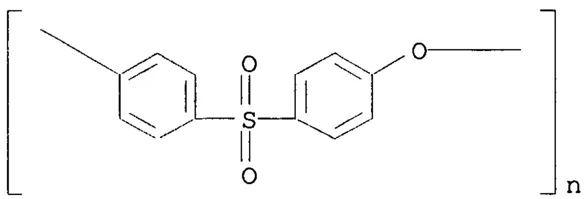
CRN 108-45-2
CMF C6 H8 N2



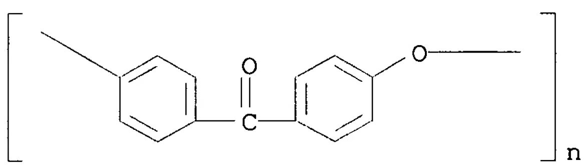
IT **25135-51-7DP,** Udel, sulfonated **25667-42-9DP,** Ultrason E, sulfonated **27380-27-4DP,** Victrex pek, sulfonated
RL: **IMF (Industrial manufacture); POF (Polymer in formulation);** PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation);** USES (Uses)
(in **composite solid polymer electrolyte membranes**)
RN 25135-51-7 HCAPLUS
CN Poly[oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene] (9CI) (CA INDEX NAME)



RN 25667-42-9 HCAPLUS
CN Poly(oxy-1,4-phenylenesulfonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



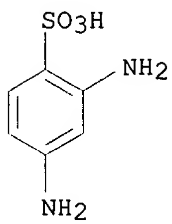
RN 27380-27-4 HCAPLUS
CN Poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



IT **220998-11-8DP**, sulfonated
RL: **IMF (Industrial manufacture)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(in **composite solid polymer electrolyte membranes**)
RN 220998-11-8 HCAPLUS
CN Benzenesulfonic acid, 2,4-diamino-, monosodium salt, polymer with 1,3-benzenediamine and 5,5'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[1,3-isobenzofurandione] (9CI) (CA INDEX NAME)

CM 1

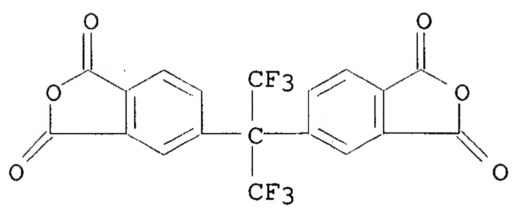
CRN 3177-22-8
CMF C6 H8 N2 O3 S . Na



● Na

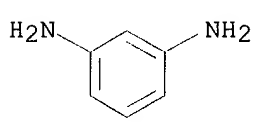
CM 2

CRN 1107-00-2
CMF C19 H6 F6 O6



CM 3

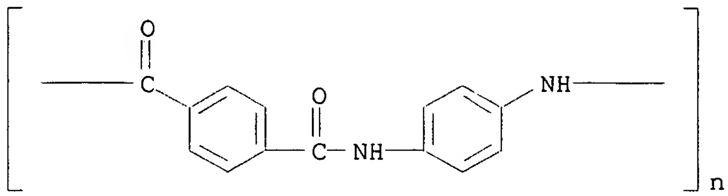
CRN 108-45-2
CMF C6 H8 N2



IT **24938-64-5**, p-Phenylenediamine-terephthalic acid copolymer, sru
25035-37-4, p-Phenylenediamine-terephthalic acid copolymer
25190-62-9, Poly(1,4-phenylene) **27028-97-3**,
Polyphenylene sulfide sulfone **31694-16-3**, PEEK
RL: **POF (Polymer in formulation)**; PRP (Properties); TEM
(Technical or engineered material use); USES (Uses)
(in **composite solid polymer**
electrolyte membranes)

RN 24938-64-5 HCAPLUS

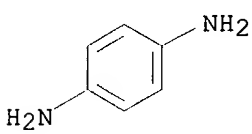
CN Poly(imino-1,4-phenyleneiminocarbonyl-1,4-phenylenecarbonyl) (9CI) (CA
INDEX NAME)



RN 25035-37-4 HCAPLUS
CN 1,4-Benzenedicarboxylic acid, polymer with 1,4-benzenediamine (9CI) (CA INDEX NAME)

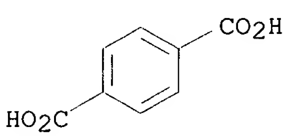
CM 1

CRN 106-50-3
CMF C6 H8 N2

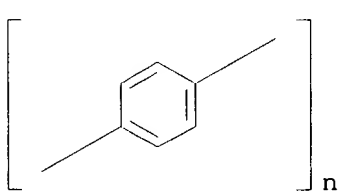


CM 2

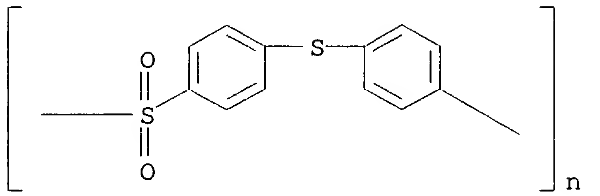
CRN 100-21-0
CMF C8 H6 O4



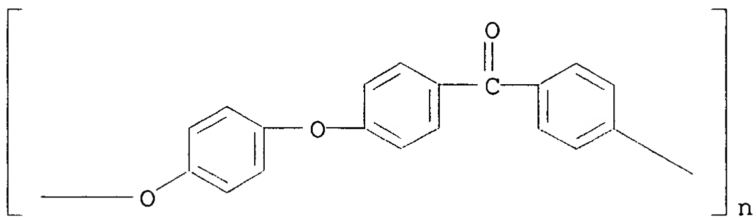
RN 25190-62-9 HCAPLUS
CN Poly(1,4-phenylene) (9CI) (CA INDEX NAME)



RN 27028-97-3 HCAPLUS
CN Poly(sulfonyl-1,4-phenylenethio-1,4-phenylene) (9CI) (CA INDEX NAME)



RN 31694-16-3 HCAPLUS
CN Poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



L63 ANSWER 32 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:271100 HCAPLUS
DN 130:325782
TI The **polymer electrolyte composition** and the secondary battery therefrom
IN Sakauchi, Hiroshi; Amano, Kosuke; Yakata, Hiroshi; Hasegawa, Etsuo
PA Nec Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C08L071-00
ICS C08G065-22; C08K003-10; C08K005-10; H01M010-40
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): **38**, 75, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11116792	A2	19990427	JP 1997-288236	19971021
	JP 3045120	B2	20000529		

AB Title **polymer electrolyte compn.** with high **ion cond.** and good mech. strength for ultra-thin secondary battery with high capacity and no leaking of electrolyte liq. when applied at high-temp. comprises a **copolymer** composed of **liq. cryst.** compd.-substituted alkylene oxide repeating unit having formula of -CH2CH(A)O- and another different alkylene oxide repeating unit having formula of -CH2CH(R)O-, and org. solvent-sol. ionic compd., optionally an org. solvent as plasticizer, where A is a liq. cryst. substitute group or a substitute group with similar structure, R is alkyl, alkoxy, fluoroalkyl, fluoroalkoxy, aryl, alkylene oxide, or hydrogen. Thus a polymer electrolyte thin film comprising 1-p-(trans-4-n-pentylcyclohexyl)phenoxy-2,3-epoxypropane-Me diethylene glycol glycidyl ether copolymer, LiPF6, and THF with wt. ratio of 12:1:100 was prepd. for assembling of a secondary battery, showing **ion**

cond. of 0.14 mS/cm.

ST **liq cryst** alkylene oxide **polymer** **electrolyte compn** secondary battery; ion compd polyelectrolyte compn secondary battery; org solvent plasticizer polyelectrolyte compn secondary battery

IT Electrolytes
Plasticizers
(polyelectrolyte compn. contg.; prepn. and properties of polyelectrolyte compn. for secondary battery)

IT Battery electrodes
Electric conductivity
(prepn. and properties of polyelectrolyte compn. for secondary battery)

IT Liquid crystals
Liquid crystals, polymeric
(prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

IT Polyoxyalkylenes, preparation
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

IT Electric conductors
(prepn. of polyelectrolyte compn. for secondary battery)

IT Polyelectrolytes
(**solid**; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

IT 12057-17-9, Lithium manganese oxide ($LiMn_2O_4$) 12190-79-3, Lithium cobalt oxide ($LiCoO_2$)
RL: TEM (Technical or engineered material use); USES (Uses)
(battery component; prepn. of polyelectrolyte compn. for secondary battery)

IT 103939-81-7P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

IT 223756-44-3P 223756-45-4P 223756-46-5P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(liq. cryst., monomer; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

IT **223756-47-6P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(liq. cryst.; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

IT **223756-49-8P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(liq. cryst.; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)

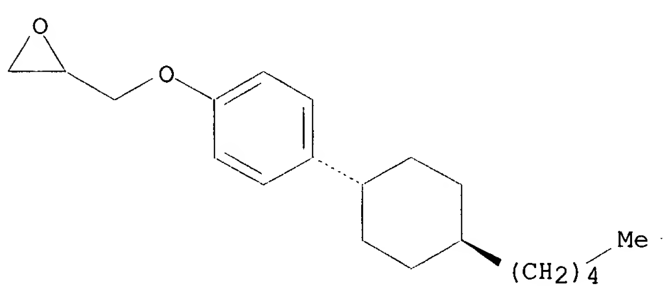
IT 96-48-0, .gamma.-Butyrolactone 108-32-7, Propylene carbonate 109-99-9, THF, uses
RL: MOA (Modifier or additive use); USES (Uses)
(plasticizer, polyelectrolyte compn. contg.; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte

compn. for secondary battery)
IT 7791-03-9, Lithium perchlorate 14283-07-9 29935-35-1 33454-82-9
132843-44-8
RL: MOA (Modifier or additive use); USES (Uses)
(polyelectrolyte compn. contg.; prepn. and properties of
polyelectrolyte compn. for secondary battery)
IT 21324-40-3 90076-65-6
RL: MOA (Modifier or additive use); USES (Uses)
(polyelectrolyte compn. contg.; prepn. of **liq. cryst**
. alkylene oxide **copolymer** for polyelectrolyte compn. for
secondary battery)
IT **223756-48-7P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
(Properties); TEM (Technical or engineered material use); PREP
(Preparation); USES (Uses)
(prepn. of **liq. cryst.** alkylene oxide
copolymer for polyelectrolyte compn. for secondary battery)
IT 104-13-2, p-Butylaniline 106-89-8, Epichlorohydrin, reactions
108-95-2, Phenol, reactions 81936-33-6 82575-69-7,
p-(trans-4-n-Pentylcyclohexyl)phenol
RL: RCT (Reactant); RACT (Reactant or reagent)
(starting material; prepn. of **liq. cryst.** alkylene
oxide **copolymer** for polyelectrolyte compn. for secondary
battery)
IT **223756-47-6P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP
(Properties); TEM (Technical or engineered material use); PREP
(Preparation); USES (Uses)
(liq. cryst.; prepn. of **liq. cryst.** alkylene oxide
copolymer for polyelectrolyte compn. for secondary battery)
RN 223756-47-6 HCAPLUS
CN Oxirane, [[2-(2-methoxyethoxy)ethoxy]methyl]-, polymer with
[[4-(trans-4-pentylcyclohexyl)phenoxy]methyl]oxirane (9CI) (CA INDEX
NAME)

CM 1

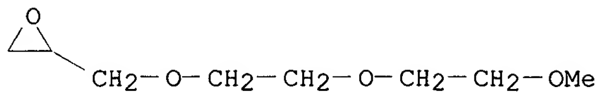
CRN 223756-44-3
CMF C20 H30 O2

Relative stereochemistry.



CM 2

CRN 71712-93-1
CMF C8 H16 O4

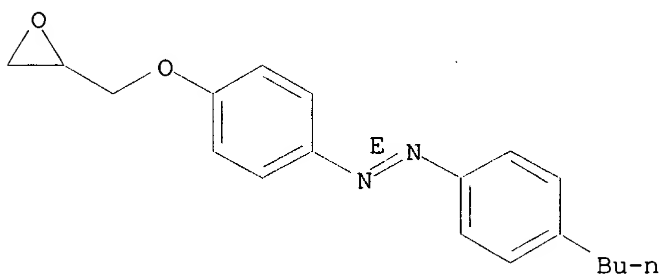


IT **223756-49-8P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(liq. cryst.; prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)
RN 223756-49-8 HCAPLUS
CN Diazene, (4-butylphenyl)[4-(oxiranylmethoxy)phenyl]-, (1E)-, polymer with [[2-(2-methoxyethoxy)ethoxy]methyl]oxirane (9CI) (CA INDEX NAME)

CM 1

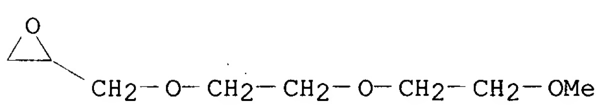
CRN 223756-46-5
CMF C19 H22 N2 O2

Double bond geometry as shown.



CM 2

CRN 71712-93-1
CMF C8 H16 O4

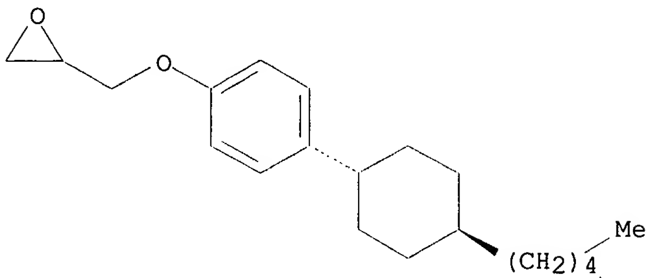


IT **223756-48-7P**
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(prepn. of **liq. cryst.** alkylene oxide **copolymer** for polyelectrolyte compn. for secondary battery)
RN 223756-48-7 HCAPLUS
CN Oxirane, [[4-(trans-4-pentylcyclohexyl)phenoxy]methyl]-, polymer with 2,5,8,11-tetraoxadodec-1-yloxirane (9CI) (CA INDEX NAME)

CM 1

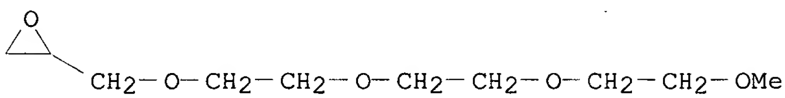
CRN 223756-44-3
CMF C20 H30 O2

Relative stereochemistry.



CM 2

CRN 73692-54-3
CMF C10 H20 O5



L63 ANSWER 33 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1999-354162 JAPIO
TI POLYMER ELECTROLYTE SECONDARY BATTERY, AND MANUFACTURE THEREOF
IN OMICHI TAKAHIRO; KAWAGUCHI TAKEYUKI
PA TEIJIN LTD
PI JP 11354162 A 19991224 Heisei
AI JP 1998-159372 (JP10159372 Heisei) 19980608
PRAI JP 1998-159372 19980608
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM H01M010-40
ICS H01M002-16
AB PROBLEM TO BE SOLVED: To provide a polymer electrolyte secondary battery provided with a **solid** polymer electrolyte layer having high strength and heat resistance and excellent in safety, and to provide manufacture thereof.
SOLUTION: A **composite** type **polymer electrolyte membrane** having 5×10<SP>-4</SP> S/cm or more of **ionic conductivity** at 25°C, 300 g or more of piercing strength and 300°C or more of dynamic heat-resisting temperature for the membrane is used for a **polymer electrolyte membrane**. The **composite** type **polymer electrolyte membrane** excellent in safety having high **ionic conductivity**, high short-circuit preventive strength and high dynamic heat resistance is utilized to provide a polymer electrolyte secondary battery with high safety by an easy manufacturing method.
COPYRIGHT: (C)1999,JPO

L63 ANSWER 34 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1999-217688 JAPIO
TI **SOLID POLYMER ELECTROLYTE**-CATALYST
COMPOSITE ELECTRODE, WATER **ELECTROLYZING** DEVICE AND FUEL

BATTERY USING THE SAME
IN HITOMI SHUJI
PA JAPAN STORAGE BATTERY CO LTD
PI JP 11217688 A 19990810 Heisei
AI JP 1998-62221 (JP10062221 Heisei) 19980226
PRAI JP 1997-369873 19971125
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM C25B011-06
ICS C25B009-00; C25B011-03; H01M004-86; H01M008-10
AB PROBLEM TO BE SOLVED: To provide a slid **polymer electrolyte**-catalyst **composite** electrode with high electronic conductivity, furthermore to provide a water electrolytic cell improved in energy efficiency and to improve a fuel battery improved in working voltage characteristics.
SOLUTION: The structure in which electronically conductive substance is carried on an **ion conducting** region in a **solid** polymer electrolyte domain of a porous **solid polymer electrolyte**-catalyst **composite** electrode contg. **solid** polymer electrolytes 2 and catalytic grains 3 is made. In the water electrolytic cell and a fuel battery, this electrode is used, and the structure in which a feeding body (collecting body) is in contact with the surface of the electrode is made.

L63 ANSWER 35 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1999-217687 JAPIO
TI PRODUCTION OF **SOLID POLYMER ELECTROLYTE** -CATALYST **COMPOSITE** ELECTRODE
IN HITOMI SHUJI
PA JAPAN STORAGE BATTERY CO LTD
PI JP 11217687 A 19990810 Heisei
AI JP 1998-82592 (JP10082592 Heisei) 19980313
PRAI JP 1997-369873 19971125
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999
IC ICM C25B011-03
ICS C25B011-08; H01M004-88
AB PROBLEM TO BE SOLVED: To produce a **solid** high **polymer electrolyte**-catalyst **composite** electrode with high electronic conductivity and good collecting performance.
SOLUTION: A porous **solid polymer electrolyte** -catalyst **composite** electrode base body contg. **solid** polymer electrolytes and catalyst grains is prepared, thereafter, the electrode base body is subjected to electroless plating, by which electronically conductive substance is deposited on the electrode base body to form an electronically conductive substance layer on the surface of the electrode base body, or the electronically conductive substance is deposited on the inner surfaces of fine pores in the main body of the electrode, or the same is deposited on an **ion conducting** region in the **solid** polymer electrolytic layer. As for the method of the electroless plating, for example, platinum group metal compd. ions are allowed to be adsorbed to **solid** polymer electrolytes, and the platinum group metal compd. ions are subjected to reducing treatment in an aq. soln. of boron hydride salt or with gaseous hydrogen.

L63 ANSWER 36 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:366124 HCAPLUS
DN 131:158044
TI Microporous **Polymeric Composite Electrolytes**

from Microemulsion Polymerization
AU Xu, Wu; Siow, Kok-Siong; Gao, Zhiqiang; Lee, Swee-Yong; Chow, Pei-Yong; Gan, Leong-Ming
CS Department of Chemistry, National University of Singapore (NUS), Singapore, 119260, Singapore
SO Langmuir (1999), 15(14), 4812-4819
CODEN: LANGD5; ISSN: 0743-7463
PB American Chemical Society
DT Journal
LA English
CC 35-4 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36, 72
AB Microporous polymeric electrolytes were prepd. from microemulsion polymn. of the system contg. acrylonitrile (AN), 4-vinylbenzenesulfonic acid lithium salt (VBSLi), ethylene glycol dimethacrylate (EGDMA), .omega.-methoxy poly(ethyleneoxy)40 undecyl-.alpha.-methacrylate (C1-PEO-C11-MA-40), and water. The polymd.-microemulsion **solids** or **membranes** have open-cell porous microstructure. The water content in membranes can readily be exchanged with many org. solvents such as .gamma.-butyrolactone (BL), a mixt. of ethylene carbonate (EC) and di-Me carbonate (DMC) or propylene carbonate (PC) and EC. The membranes can also be filled with electrolyte solns. such as 1 M LiBF4/BL, 1 M LiSO3CF3/PC-EC, or 1 M LiClO4/EC-DMC to form **polymeric composite electrolytes**. Such composite electrolytes, exhibiting **ionic cond.** of 10-3 S cm-1 (25.degree.) are suitable for use in electrochem. devices.
ST **polymer electrolyte composite** prepn microemulsion methacrylate; porous microstructure acrylic polymer electrolyte lithium salt; **membrane solid polymer electrolyte** water exchange solvent; **ionic cond** polymer electrolyte acrylic lithium salt
IT Polyoxyalkylenes, preparation
RL: PRP (Properties); **SPN (Synthetic preparation); PREP (Preparation)**
(acrylic, lithium complexes; effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)
IT **Ionic conductivity**
Phase diagram
Polymer **electrolytes**
Swelling, physical
(effects of **compn.** and microemulsion **polymn.** conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)
IT Polymerization
(microemulsion; effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)
IT Emulsions
(microemulsions, **solids** and **membranes**; effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)
IT Polymer morphology
(phase, porous; effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)
IT Supramolecular structure
(polymer-salt composite; effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)

IT 7439-93-2DP, Lithium, polyoxyalkylene-acrylate complexes, preparation
237770-04-6DP, Acrylonitrile-ethylene glycol dimethacrylate-4-vinylbenzenesulfonic acid, lithium salt-.omega.-methoxy poly(ethyleneoxy)40-undecyl-.alpha.-methacrylate copolymer, lithium complexes
RL: PRP (Properties); **SPN (Synthetic preparation); PREP (Preparation)**
(effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)

IT 7791-03-9, Lithium perchlorate (LiClO4) 14283-07-9 33454-82-9, Lithium trifluoromethanesulfonate
RL: PRP (Properties)
(**electrolyte**; effects of **compn.** and microemulsion **polymn.** conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)

IT 96-48-0 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Methyl carbonate
RL: NUU (Other use, unclassified); USES (Uses)
(exchange solvent; effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)

RE.CNT 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD

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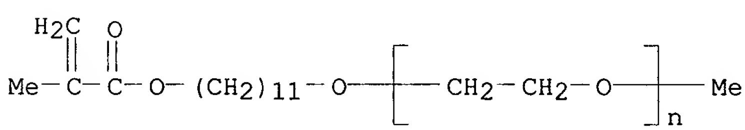
IT **237770-04-6DP**, Acrylonitrile-ethylene glycol dimethacrylate-4-vinylbenzenesulfonic acid, lithium salt-.omega.-methoxy poly(ethyleneoxy)40-undecyl-.alpha.-methacrylate copolymer, lithium complexes
RL: PRP (Properties); **SPN (Synthetic preparation)**; **PREP (Preparation)**
(effects of compn. and microemulsion polymn. conditions on structure of microporous poly(ether acrylate)-lithium salt composite electrolytes)

RN 237770-04-6 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with lithium 4-ethenylbenzenesulfonate, .alpha.-methyl-.omega.-[[11-[(2-methyl-1-oxo-2-propenyl)oxy]undecyl]oxy]poly(oxy-1,2-ethanediyl) and 2-propenenitrile (9CI) (CA INDEX NAME)

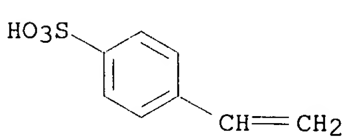
CM 1

CRN 174508-47-5
CMF (C2 H4 O)n C16 H30 O3
CCI PMS



CM 2

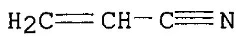
CRN 4551-88-6
CMF C8 H8 O3 S . Li



Li

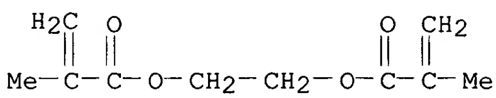
CM 3

CRN 107-13-1
CMF C3 H3 N



CM 4

CRN 97-90-5
CMF C10 H14 O4



L63 ANSWER 37 OF 82 RAPRA COPYRIGHT 2002 RAPRA
AN R:742167 RAPRA FS Rapra Abstracts
TI **IONIC CONDUCTION** IN **POLYMER ELECTROLYTES**/MICROPOROUS **MEMBRANE COMPOSITES.**
AU Korzhova N; Fisher S L; Le Granvalet-Mancini M; Teeters D
CS Tulsa,University; Nantes,University
SO ACS Polymeric Materials Science & Engineering.Volume 80.Conference proceedings
Editor(s): ACS,Div.of Polymeric Materials Science & Engng.
Anaheim, Ca., Spring 1999, p.618-9
PY 1999
DT Conference Article
LA English
AB A wax-like **solid** electrolyte was complexed with lithium triflate and forced through various micro-porous membranes. The objective was to enhance **ionic conductivity** by: causing the interface between the micro-pores and the polymer electrolyte to mimic the conditions found in other filled polymer electrolyte systems; and creating a favourable alignment of the molecules. The electrical properties were determined by AC impedance measurements, and the membrane pores were investigated using atomic force microscopy. The **ionic conductivity** of the electrolyte material in an alumina membrane was enhanced compared with the pure electrolyte material. 16 refs.
CC 6M; 981
SC *UI; QM
CT ALIGNMENT; ATOMIC FORCE MICROSCOPY; **COMPOSITE**; COMPOSITION; ELECTRICAL CONDUCTIVITY; ELECTRICAL PROPERTIES; ELECTROLYTE; EVALUATION; GRAPH; INSTITUTION; **IONIC CONDUCTIVITY**; MEMBRANE; PORE STRUCTURE; PROPERTIES; **SOLID STATE**; TECHNICAL; WAX
NPT ALUMINA; ALUMINIUM OXIDE; LITHIUM TRIFLATE
SHR ELECTROLYTES, **ionic conductivity**, **composites**, membranes; **IONIC CONDUCTIVITY**, electrolytes, **composites**, membranes; **COMPOSITES**, electrolytes, membranes, **ionic conductivity**; MEMBRANES, electrolytes, **ionic conductivity**, **composites**
GT EUROPEAN COMMUNITY; EUROPEAN UNION; FRANCE; USA; WESTERN EUROPE

L63 ANSWER 38 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 990769229 JICST-EPlus
TI OHM Techno-Guidance. (66).
AU HANADA TAKEAKI
YAMAUCHI SHIRO
CS Ryosaitekunika
Mitsubishi Electr. Corp.
SO OHM, (1999) vol. 86, no. 8, pp. 69-72. Journal Code: F0136A (Fig. 8, Tbl. 3)
CODEN: DZAOAE; ISSN: 0386-5576
CY Japan
DT Journal; Commentary
LA Japanese
STA New
AB A dehumidifier for **substrate** due to a new principle to electrochemically transfer and remove humidity in the air by using a **solid polymeric electrolyte membrane** was introduced. This dehumidifier is comprised of a dehumidifying element covered with porous metal electrodes at both sides of a **solid polymeric electrolyte membrane** of a hydrogen **ion conductor** and an electric source. Characteristics of this dehumidifier consist in enegy saving, small size and high performance and to keep dehumidification capacity even at cold area, no emission of water drop, and defumidification ability to low humidity. And, a test data on mounting to a 1.8 m3 control board was shown.
CC PC02050M (628.853+697.93)
CT porous electrode; switch board; dehumidifier; dehumidifying; electrolysis; economy(efficiency); polyelectrolyte; cold region; electrochemistry
BT electrode; electric power equipment; humidistat; equipment; humidity control; adjustment; removal; electrochemical reaction; chemical reaction; property; functional polymer; macromolecule; electrolyte; matter; physical chemistry; chemistry; natural science; science

L63 ANSWER 39 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:414651 HCAPLUS
DN 129:83769
TI **Solid polymer electrolyte composition** for fuel cells
IN Watanabe, Masahiro; Uchida, Hiroyuki
PA Tanaka Kikinzoku Kogyo K.K., Japan; Masahiro Watanabe
SO U.S., 16 pp., Cont.-in-part of U.S. Ser. No. 261,636, abandoned.
CODEN: USXXAM
DT Patent
LA English
IC ICM H01M008-10
NCL 429033000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5766787	A	19980616	US 1995-516395	19950817
	JP 07090111	A2	19950404	JP 1994-159132	19940617
PRAI	JP 1993-172683	A	19930618		
	JP 1994-85805	A	19940331		
	US 1994-261636	B2	19940617		

AB The **compn.** comprises **solid polymer electrolyte** selected from cation and anion exchange resin and 0.01-80 wt.% of .gtoreq.1 metal catalyst selected from the Pt, Au, Pd, Rh, Ir and Ru contained in the **solid** polymer electrolyte. The

compn. may further contain 0.01-50 wt.% particles and/or fibers of .gtoreq.1 metal oxide. The membrane made of the compn. possesses the abilities of producing H_2O by itself and of retaining the H_2O so that the **ionic cond**. and the effect of depressing the crossover is excellent. Accordingly, the cell employing the membrane possesses superior performance.

ST fuel cell polymer electrolyte metal catalyst; metal oxide polymer electrolyte fuel cell

IT Perfluoro compounds
RL: TEM (Technical or engineered material use); USES (Uses)
(carboxylic acids, **polymers; electrolyte compn**. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Polysulfones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-contg., ionomers; electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine-contg., sulfo-contg., ionomers; electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(perfluoro, **polymers; electrolyte compn.** for fuel cells from metal catalyst- and metal oxide-contg.)

IT Sulfonic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(perfluorosulfonic acid **polymers; electrolyte compn**. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-contg., ionomers; electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg.; electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT Fuel cell electrolytes
(**solid** polymer contg. metal catalyst and metal oxide)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(sulfo-contg.; electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT **9003-55-8**, Butadiene-styrene copolymer **56619-18-2**, Styrene-vinylbenzene sulfonic acid copolymer
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)

IT 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-57-5, Gold, uses
RL: CAT (Catalyst use); USES (Uses)
(**solid polymer electrolyte compn**

. for fuel cells contg.)
IT 1309-48-4, Magnesia, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses 18282-10-5, Stannic oxide
RL: MOA (Modifier or additive use); USES (Uses)
(**solid polymer electrolyte compn**
. for fuel cells contg.)
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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IT **9003-55-8**, Butadiene-styrene copolymer **56619-18-2**, Styrene-vinylbenzene sulfonic acid copolymer
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte compn. for fuel cells from metal catalyst- and metal oxide-contg.)
RN 9003-55-8 HCAPLUS
CN Benzene, ethenyl-, polymer with 1,3-butadiene (9CI) (CA INDEX NAME)

CM 1

CRN 106-99-0
CMF C4 H6

$H_2C{=}CH{-}CH{=}CH_2$

CM 2

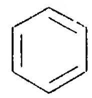
CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

RN 56619-18-2 HCAPLUS
CN Benzenesulfonic acid, ethenyl-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 26914-43-2
CMF C8 H8 O3 S
CCI IDS



D1—CH=CH2

D1—SO3H

CM 2

CRN 100-42-5
CMF C8 H8

H2C=CH—Ph

L63 ANSWER 40 OF 82 HCAPLUS
AN 1998:693672 HCAPLUS
DN 130:27248
TI Secondary batteries, proton-conducting polymer electrolytes, and electrode active mass
IN Takeuchi, Masataka; Ookubo, Takashi
PA Showa Denko K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01B001-12
ICS C08F020-00; C08G018-06; C08G061-02; C08G073-00; C08L075-00; H01M004-02; H01M004-50; H01M004-60; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10289617	A2	19981027	JP 1997-97435	19970415

AB Claimed secondary batteries use proton-conducting polymer **solid** electrolytes. Claimed electrolytes contain protonic acids and are obtained from compds. having polymg. functional group CH2:C(R1)CO2 or CH2C(R2)CO(OR3)xNHCO2 (R1, R2 = H or alkyl; R3 = C<10 divalent group; x = 0-10) by polymn. using heat and/or active light. Claimed electrodes use composites of active mass selected from polymers having sulfonic acid side chains, polymers contg. polypyridine, polypyrimidine, and/or polyquinone in the backbone, or Mn oxides with the above polymer electrolytes. The batteries have high safety, reliability, large capacity, and long cycle life.
ST proton conducting polymer electrolyte battery safety; **composite** electrode **polymer electrolyte**; photopolymn proton conducting polymer electrolyte; urethane acrylic polyoxyalkylene electrolyte battery
IT Battery electrodes

Battery electrolytes
Conducting polymers
Secondary batteries
(batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Polyamines
Polyanilines
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(**composites** with **polymer electrolytes**, electrodes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Acids, uses
Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(electrolytes contg.; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Urethanes
RL: DEV (Device component use); USES (Uses)
(electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Polyoxyalkylenes, uses
Polyoxyalkylenes, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(fluorine-contg., electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(fluorine-contg., perfluoro, acrylic, electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Safety
(in manuf. of proton-conducting polymer electrolytes for batteries)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(perfluoro, perfluoro, acrylic, electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT **Ionic conductors**
(polymeric; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Sulfonic acids, uses
Sulfonic acids, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(**polymers, composites** with **polymer electrolytes**, electrodes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP

(Preparation); USES (Uses)
(polyoxyalkylene-, electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Fluoropolymers, uses
Fluoropolymers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(polyoxyalkylene-, perfluoro, acrylic, electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT Polymers, uses
Polymers, uses
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(sulfo-contg., **composites** with **polymer electrolytes**, electrodes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT 25013-01-8, Polypyridine 71730-08-0
RL: DEV (Device component use); USES (Uses)
(**composites** with **polymer electrolytes**, electrodes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT 7446-11-9DP, Sulfuric anhydride, reaction products with polyaniline 11129-60-5P, Manganese oxide **25233-30-1DP**, Polyaniline, sulfonated **25233-30-1P**, Polyaniline 26745-90-4P 190201-51-5P, Pyrimidine homopolymer
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(**composites** with **polymer electrolytes**, electrodes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT 104-15-4, uses 7664-38-2, Phosphoric acid, uses
RL: DEV (Device component use); USES (Uses)
(electrolytes contg.; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT 202739-72-8P
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(electrolytes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

IT 76287-91-7P 87260-75-1P 203391-79-1DP, reaction products with polyoxyalkylenes, fluorine-contg.
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(prepn. of; in manuf. of proton-conducting polymer electrolytes for batteries)

IT 30674-80-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, urethane compds. from; in manuf. of proton-conducting polymer electrolytes for batteries)

IT 25791-96-2
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with methacryloyloxyethyl isocyanate; in manuf. of proton-conducting polymer electrolytes for batteries)

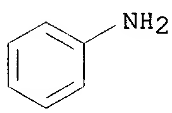
IT 375-01-9, 2,2,3,3,4,4,4-Heptafluoro-1-butanol 37286-64-9, Polyoxypropylene monomethyl ether 107852-51-7, Fomblin Z-DOL
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with methacryloyloxyethylisocyanate; in manuf. of proton-conducting polymer electrolytes for batteries)

IT **25233-30-1DP**, Polyaniline, sulfonated **25233-30-1P**, Polyaniline
RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(**composites** with **polymer electrolytes**, electrodes; batteries using proton-conducting polymer **electrolytes** and **polymer composite** electrodes)

RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

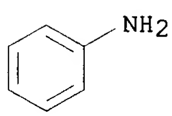
CRN 62-53-3
CMF C6 H7 N



RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



L63 ANSWER 41 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:314756 HCAPLUS
DN 129:55248
TI **Ionically conductive** polymer membranes with good mechanical strength and adhesion to **solid** electrochemical cells and their manufacture
IN Kim, Eun Kyung; Lee, Suh Bong; Kim, Hee Jung
PA Korea Research Institute of Chemical Technology, Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C08F290-06
ICS C08F002-44; C08L055-00; H01M010-40
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 52, 72

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10130346	A2	19980519	JP 1997-222603	19970819
	US 5958997	A	19990928	US 1997-912416	19970818
PRAI	KR 1996-34269		19960819		

AB The membranes are prepd. by curing compns. comprising (A) 1-50% A+B- [A+ = alkali ion; B- = Cl-, Br-, I-, SCN-, ClO4-, CF3SO3-, N(CF3SO3)2-, BF4-, PF6-, AsF6-], (B) 0.1-20% photocuring initiators, (C) 1-60% CH2:CR1CO2(CH2CH2O)mR1 (R1 = H, C1-20 linear or branched lower alkyl; m = 200-1000), (D) 1-60% (on C) CH2CR1CO2(CHR2CH2O)nCOCR1:CH2 (R1 = same as above; R2 = R1, O2CCHR1:CH2; n = 1-10) as curing agents, and (E) 1-50% CR1R3:CH2 (R1 = same as above; R3 = Ph, O2CR1) by UV rays with wave length 200-400 nm to form polymer networks. Polyethylene glycol methacrylate Me ether 5, tripropylene glycol dimethacrylate 1, Bu methacrylate 1, dimethoxyphenylacetophenone 0.5, and LiCF3SO3 1.48 g were mixed, applied onto a Li-Cu alloy foil, and exposed to UV rays to give a **membrane** as a **solid** electrolyte showing **ion cond.** 1 .times. 10-4 S/cm.

ST **ion cond** membrane polyoxyalkylene acrylate copolymer; **solid** electrochem cell electrolyte **membrane**

IT Crosslinking
(by UV rays; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT UV radiation
(crosslinking by; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT Membranes, nonbiological
(manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT Alkali metal salts
RL: CAT (Catalyst use); USES (Uses)
(photopolymn. initiators; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT Polymerization catalysts
(photopolymn., alkali metal salts; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT Battery electrolytes
Electrochemical cells
(**solid**; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT 208719-27-1P, Butyl methacrylate-polyethylene glycol methacrylate methyl ether-tripropylene glycol dimethacrylate copolymer **208719-28-2P**, Polyethylene glycol methacrylate methyl ether-styrene-tripropylene glycol dimethacrylate copolymer 208719-29-3P
RL: **IMF (Industrial manufacture)**; PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(**ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT 7791-03-9, Lithium perchlorate 33454-82-9, Lithium

trifluoromethanesulfonate
RL: CAT (Catalyst use); USES (Uses)
(photopolymn. initiator; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT 108-32-7
RL: MOA (Modifier or additive use); USES (Uses)
(plasticizer; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

IT 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 12643-47-9
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; manuf. of **ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

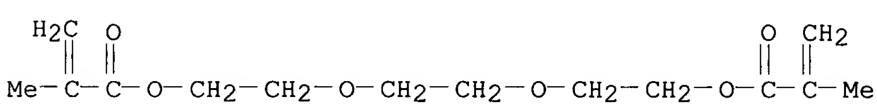
IT **208719-28-2P**, Polyethylene glycol methacrylate methyl ether-styrene-tripropylene glycol dimethacrylate copolymer
RL: **IMF (Industrial manufacture)**; PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(**ionically conductive** polyoxyalkylene (meth)acrylate **polymer membranes** for **electrolytes** for **solid** electrochem. cells)

RN 208719-28-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, (1-methyl-1,2-ethanediyl)bis[oxy(methyl-2,1-ethanediyl)] ester, polymer with ethenylbenzene and .alpha.-(2-methyl-1-oxo-2-propenyl)-.omega.-methoxypoly(oxy-1,2-ethanediyl) (9CI) (CA INDEX NAME)

CM 1

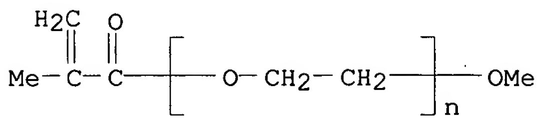
CRN 51247-87-1
CMF C17 H28 O6
CCI IDS



3 (D1—Me)

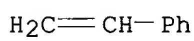
CM 2

CRN 26915-72-0
CMF (C2 H4 O)n C5 H8 O2
CCI PMS



CM 3

CRN 100-42-5
CMF C8 H8



L63 ANSWER 42 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:108194 HCAPLUS
DN 128:238035
TI **Solid** electrolytes with high **ion conductivity** at low temperature and excellent flexibility
IN Ota, Ken; Kuramochi, Hiroshi
PA Fukoku K. K., Japan; Polytech Design K. K.
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C08L033-20
ICS C08L033-04; H01B001-06; H01M006-18; H01M008-02; H01M008-10; H01M010-40
CC 76-2 (Electric Phenomena)
Section cross-reference(s): **38**, 39, 52
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10045994	A2	19980217	JP 1996-208062	19960807

AB The electrolytes comprise (A) the 1st polymers contg. (CH2CR1CN) (R1 = H, Me), [CH2CR2(CO2CnH2n+1)] (R2 = H, Me; n = 1-5), and [CH2CR3(CO2CmH2mXC1H21+1)] (R3 = H, Me; m = 1-3; 1 = 1-5; X = O, S), (B) org. electrolytic solns. which are compatible with (A) and (C) the 2nd noncrosslinkable polymers which are incompatible with A. The 2nd polymers may be hydrocarbon- or silicone-based elastomers. Thus, 8 parts (**solid**) Et acrylate-acrylonitrile copolymer soln. was blended with 2 parts (**solid**) maleated styrene-butylene-ethylene rubber, **cast** on a Teflon plate, and dried to give a 80-.mu.m-thickness film, while Li perchlorate was dissolved in 70:30 (%) propylene carbonate/THF to give a 1.0-mol/l electrolytic soln. Then, the film was immersed in the soln. for 24 h to give a **solid** electrolyte film showing tensile strength (JIS K 6301) 15.1 kg/cm2 and **ion cond**. 8.5, 5.8, 4.6, 3.0, 1.7, and 1.0 (.times. 10-3 s/cm2) at 50.degree.. 40.degree., 30.degree., 20.degree., 15.degree., 5.degree., (-10).degree., and (-20).degree., resp.
ST **polymer** rubber **composite** film **electrolyte** strength; **ion cond** improved **solid** electrolyte film; acrylic polymer styrene rubber blend film
IT Synthetic rubber, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(butene-ethylene-styrene, maleated, block; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT Electrolytes
Electrolytic solutions
Primary batteries
(electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT Polymer blends
Silicone rubber, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT Nitrile rubber, properties
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(hydrogenated; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 204442-49-9P
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 108-31-6D, Maleic anhydride, reaction products with Butylene-ethylene-styrene rubber 25053-12-7, Ethyl acrylate-acrylonitrile copolymer
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 7791-03-9, Lithium perchlorate
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 108-32-7, Propylene carbonate 109-99-9, THF, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(electrolytic soln.; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 110-71-4, 1,2-Dimethoxyethane 616-38-6, Dimethyl carbonate 646-06-0, 1,3-Dioxolane 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium fluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolytic solns.; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 9003-18-3
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(nitrile rubber, hydrogenated; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT 9003-18-3D, Acrylonitrile-butadiene copolymer, hydrogenated

106108-28-5D, Butylene-ethylene-styrene block copolymer, maleated
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(rubber; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

IT **106108-28-5D**, Butylene-ethylene-styrene block copolymer, maleated
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(rubber; electrolyte films of acrylic polymer/rubber blends with high **ion cond.** and excellent flexibility)

RN 106108-28-5 HCAPLUS
CN Benzene, ethenyl-, polymer with butene and ethene, block (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

CM 2

CRN 74-85-1
CMF C2 H4

$H_2C{=}CH_2$

CM 3

CRN 25167-67-3
CMF C4 H8
CCI IDS

CM 4

CRN 106-97-8
CMF C4 H10

$H_3C{-}CH_2{-}CH_2{-}CH_3$

L63 ANSWER 43 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:105903 HCAPLUS
DN 128:156593
TI Methanol fuel cells
IN Okamoto, Takafumi
PA Honda Motor Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese

IC ICM H01M008-02
ICS H01M008-02; H01M008-10; C08J005-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10040936	A2	19980213	JP 1996-198076	19960726

AB The fuel cells have a **solid polymer electrolyte membrane** held between a cathode and an anode, MeOH supplied to the anode, an oxidant supplied to the cathode; where the electrolyte membrane has a MeOH oxidn. catalyst embedded in an ion exchanger film and, on the cathode side, have a **cast** porous film of an **ion conductive** component formed from an alc. soln. or an **ion conductive** component impregnated porous film.

ST methanol fuel cell polymer electrolyte structure; ion exchanger methanol oxidn catalyst electrolyte

IT Fuel cell **electrolytes**
(ion exchanger **polymer electrolyte membranes** contg. embedded methanol oxidn. catalysts for methanol fuel cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(ion exchanger **polymer electrolyte membranes** contg. embedded methanol oxidn. catalysts for methanol fuel cells)

IT 67-56-1, Methanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(ion exchanger **polymer electrolyte membranes** contg. embedded methanol oxidn. catalysts for methanol fuel cells)

L63 ANSWER 44 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:277540 HCAPLUS
DN 129:16529
TI Polyether copolymer, and **polymer** solid **electrolyte composition** for use in batteries
IN Miura, Katsuhito; Yanagida, Masanori; Higobashi, Hiroki; Endo, Takahiro
PA Daiso Co., Ltd., Japan
SO Eur. Pat. Appl., 35 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C08G065-08
ICS C08G065-14; C08K003-00; H01M006-18; H01B001-12
CC 35-7 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 72
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 838487	A2	19980429	EP 1997-118729	19971028
	EP 838487	A3	19980722		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 10130487	A2	19980519	JP 1996-285047	19961028
	JP 10176105	A2	19980630	JP 1996-336783	19961217
	US 5968681	A	19991019	US 1997-958664	19971028
	JP 10204172	A2	19980804	JP 1997-308562	19971111
	JP 3282565	B2	20020513		
PRAI	JP 1996-285047	A	19961028		

JP 1996-312228 A 19961122
JP 1996-336783 A 19961217

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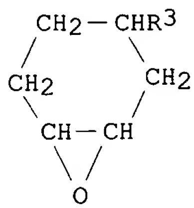


I

AB A polyether prepd. from 5-95 mol% QO(CHMeCH2O)nR1 (R = C1-12-alkyl, alkenyl of 2-8 C atoms, cycloalkyl, aryl, aralkyl, and tetrahydropyranyl; n = 1-12; Q = glycidyl), 5-95 mol% oxirane, and 0-15 mol% R2J (J = oxiranyl; R2 = substituent having ethylenically unsatd. group, or one having reactive Si or halogen group, having epoxy group at the terminal end) or I (R3 = R2) as a crosslinking component has a wt.-av. mol. wt. (Mw) 103-107 and is blended with plasticizer and an electrolyte salt. The copolymer provides a polymer solid electrolyte superior in **ionic cond.** and also superior in processability, moldability, mech. strength and flexibility. Thus, the copolymer (83:17) of ethyene oxide and dipropylene glycol glycidyl Me ether having a wt.-av. mol. wt. 2,400,000 and cond. (35.degree.) 4.6 .times. 10-5 S/cm was mixed with acetonitrile soln. of Li bistrifluoromethane sulfonylimide, **cast** as a film, and dried, and placed between a foil and Li cobaltate plate to form a secondary battery electrode.

ST solid electrolyte polyether battery secondary; salt polyether solid electrolyte; plasticizer polyether solid electrolyte; solvent plasticizer polyether; polyoxyalkylene salt plasticizer polyether; crosslinked polyether solid electrolyte

IT Polyoxyalkylenes, preparation
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(lithium complexes; polyether copolymer manuf. and compn. for use in batteries)

IT **Ionic conductivity**
(of polyether complex compn. for use in batteries)

IT Battery electrolytes
(polyether complex compn. for use in batteries)

IT Secondary batteries
(polyether copolymer manuf. and compn. for use in)

IT Solid electrolytes
(polyether copolymer manuf. and compn. for use in batteries)

IT Plasticizers
(solid electrolyte compn.; polyether complex compn. for use in batteries)

IT 7791-03-9, Lithium perchlorate 90076-65-6, Lithium bistrifluoromethane sulfonylimide
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte; polyether complex compn. for use in batteries)

IT 9004-74-4D, Polyethylene glycol monomethyl ether, octylaluminum complexes
24991-55-7, Polyethylene glycol dimethyl ether 25852-47-5, Polyethylene glycol dimethacrylate 26570-48-9, Polyethylene glycol diacrylate
27274-31-3D, Polyethylene glycol monoallyl ether, octylaluminum complexes
27879-07-8D, Polyethylene glycol monoethyl ether, octylaluminum complexes

31494-81-2, Polyethylene glycol monomethyl ether sodium salt 53609-62-4, Polyethylene glycol diethyl ether 59788-01-1, Polyethylene glycol diallyl ether 91848-80-5 153815-02-2 157433-30-2 203863-94-9 206565-75-5 206565-76-6
RL: TEM (Technical or engineered material use); USES (Uses)
(plasticizer; polyether complex compn. for use in batteries)

IT 206543-19-3DP, lithium complexes 206543-23-9DP, lithium complexes 206543-69-3DP, lithium complexes 206667-42-7DP, Dipropylene glycol glycidyl allyl ether-ethylene oxide copolymer, lithium complexes 206667-43-8DP, lithium complexes 206667-44-9DP, lithium complexes 206667-45-0DP, lithium complexes 206667-46-1DP, lithium complexes 206667-47-2DP, lithium complexes 206667-48-3DP, lithium complexes 206667-49-4DP, lithium complexes 206667-50-7DP, lithium complexes 206667-51-8DP, lithium complexes 206667-52-9DP, lithium complexes 206667-53-0DP, lithium complexes 206667-54-1DP, lithium complexes 206667-55-2DP, lithium complexes 206667-56-3DP, lithium complexes 207301-79-9DP, lithium complexes
RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(polyether complex compn. for use in batteries)

IT 206543-22-8P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(polyether complex compn. for use in batteries)

IT 106-89-8, Epichlorohydrin, reactions 34590-94-8, Dipropylene glycol monomethyl ether
RL: RCT (Reactant); RACT (Reactant or reagent)
(polyether complex compn. for use in batteries)

IT **206667-57-4D**, lithium complexes **206667-58-5D**, lithium complexes
RL: TEM (Technical or engineered material use); USES (Uses)
(polyether complex compn. for use in batteries)

IT 96-48-0, .gamma.-Butyrolactone 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses 112-49-2, Triethylene glycol dimethyl ether 143-24-8, Tetraethylene glycol dimethyl ether 4353-28-0, Tetraethylene glycol diethyl ether 4437-85-8, Butylene carbonate 4499-99-4, Triethylene glycol diethyl ether 19836-78-3
RL: TEM (Technical or engineered material use); USES (Uses)
(solvent for solid electrolyte; polyether complex compn. for use in batteries)

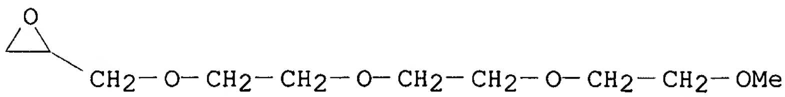
IT **206667-57-4D**, lithium complexes **206667-58-5D**, lithium complexes
RL: TEM (Technical or engineered material use); USES (Uses)
(polyether complex compn. for use in batteries)

RN 206667-57-4 HCAPLUS

CN 1H-Pyrrole-2,5-dione, 1,1'-(1,3-phenylene)bis-, polymer with oxirane and (trimethyl-2,5,8,11-tetraoxadodec-1-yl)oxirane (9CI) (CA INDEX NAME)

CM 1

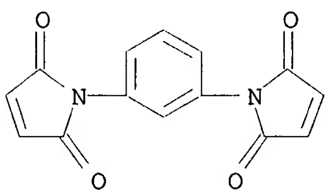
CRN 163148-54-7
CMF C13 H26 O5
CCI IDS



3 (D1—Me)

CM 2

CRN 3006-93-7
CMF C14 H8 N2 O4



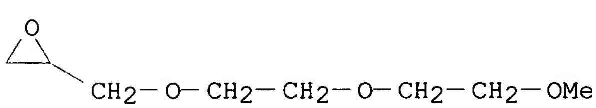
CM 3

CRN 75-21-8
CMF C2 H4 O

RN 206667-58-5 HCAPLUS
CN 1H-Pyrrole-2,5-dione, 1,1'-(1,3-phenylene)bis-, polymer with [[2-(2-methoxymethylethoxy)methylethoxy]methyl]oxirane, oxirane and [(2-propenyloxy)methyl]oxirane (9CI) (CA INDEX NAME)

CM 1

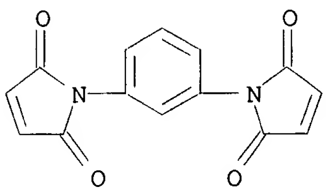
CRN 206543-22-8
CMF C10 H20 O4
CCI IDS



2 (D1—Me)

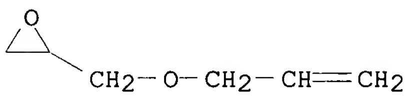
CM 2

CRN 3006-93-7
CMF C14 H8 N2 O4



CM 3

CRN 106-92-3
CMF C6 H10 O2



CM 4

CRN 75-21-8
CMF C2 H4 O

L63 ANSWER 45 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:783837 HCAPLUS
DN 128:63952
TI Continuous process to produce lithium-polymer batteries and their components
IN Chern, Terry Song-hsing; Keller, David Gerald; MacFadden, Kenneth Orville
PA W.R. Grace + Co.-Conn., USA
SO PCT Int. Appl., 20 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9744847	A1	19971127	WO 1997-US8029	19970513

W: BR, CA, CN, JP, MX
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

US 5749927	A	19980512	US 1996-653172	19960524

PRAI US 1996-653172 19960524
AB Solid polymer electrolytes are **extruded** with active electrode material in a continuous, 1-step process to form **composite** electrolyte-electrodes ready for assembly into batteries. The **composite** electrolyte-electrode sheets are **extruded** onto current collectors to form electrodes, which are electronically and **ionically conductive**. The **composite** electrodes can be overcoated with a solid polymer electrolyte, which acts as a separator upon battery assembly. The interface between the solid **polymer electrolyte composite** electrodes and the solid polymer electrolyte separator has low resistance.
ST lithium polymer battery continuous manuf
IT Coke
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in continuous manuf. of anode-**electrolyte composite** for lithium-**polymer** batteries)
IT Carbon black, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in continuous manuf. of cathode-**electrolyte composite** for lithium-**polymer** batteries)
IT Secondary batteries
(lithium; continuous process to produce lithium-polymer batteries and their components)
IT 1313-13-9, Manganese dioxide, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in continuous manuf. of cathode-**electrolyte composite** for lithium-**polymer** batteries)
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 21324-40-3, Lithium fluophosphate 25014-41-9, Polyacrylonitrile
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in continuous manuf. of components for lithium-polymer batteries)
IT 116788-50-2, Hypermer KD1
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in continuous manuf. of electrode-**electrolyte composite** for lithium-**polymer** batteries)

L63 ANSWER 46 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:610850 HCAPLUS
DN 133:166307
TI Battery with **composite polymer electrolyte**
IN Lee, Dong-ill; Sun-woo, Joon; Lim, Mi-ra
PA LG Metals Co., Ltd., S. Korea
SO Repub. Korea, No pp. given
CODEN: KRXXFC
DT Patent
LA Korean
IC ICM H01M010-36
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	KR 125151	B1	19971215	KR 1994-39510	19941230

AB The battery having complex high-polymer electrolyte comprises one selected from a group composing of polymethacrylic acid, polystyrene and polyvinyl acetate, wherein the **solid** battery has the complex high-polymer electrolyte including a plasticizer, an **ionic conduction**

products and lithium. Thereby, temp. dependent characteristic is significantly improved by using liq. plasticizer more than a conventional characteristic.
ST battery **composite polymer electrolyte**
IT Battery **electrolytes**
Polymer **electrolytes**
(battery with **composite polymer electrolyte**
)
IT Plasticizers
(liq.; battery with **composite polymer**
electrolyte)
IT 9003-20-7, Polyvinyl acetate **9003-53-6**, Polystyrene
25087-26-7, Poly methacrylic acid
RL: DEV (Device component use); USES (Uses)
(battery with **composite polymer electrolyte**
)
IT **9003-53-6**, Polystyrene
RL: DEV (Device component use); USES (Uses)
(battery with **composite polymer electrolyte**
)
RN 9003-53-6 HCAPLUS
CN Benzene, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

L63 ANSWER 47 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:756796 HCAPLUS
DN 128:62514
TI Aromatic polyamide polyelectrolyte **composite** membranes and their manufacture
IN Iwasaki, Katsuhiko; Terahara, Atsushi; Isobe, Michihisa
PA Sumitomo Chemical Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C08J005-18
ICS C08K003-00; C08L077-10; H01M006-18; H01M010-40
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 52
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09302115	A2	19971125	JP 1996-119293	19960514

AB The membranes are manufd. by (A) forming a membrane structure from a soln. contg. 1-10% alkali or alk. earth chlorides and 1-10% para-oriented arom. polyamide with intrinsic viscosity 1.02-2.5 dL/g; (B) pptg. the polyamide by retaining the structure at .gtoreq.20.degree. or .ltoreq.-10.degree.; (C) soaking the membrane structure in aq. soln. or alc. soln. to eluate the chlorides and drying; and (D) filling a **polymeric electrolyte** into the **membrane**. Adding 132.9 g p-phenylenediamine to a soln. contg. 4200 g NMP and 272.7 g CaCl2, keeping

the soln. at 20.+-.2.degree., adding 243.3 g terephthaloyl chloride, ageing the soln. at 20.+-.2.degree. for 1 h, stirring under vacuum gave a polyamide with viscosity 1.98 dL/g. Adding CaCl2-NMP soln. to the polyamide soln., solvent **casting** on a glass plate, and soaking in water gave a 11.4-.mu.m membrane with porosity 45%. Soaking the membrane in a soln. contg. 8 g polyoxyethylene di-Me ether and 2 g LiBF4 at 80.degree. gave a **composite** membrane with cond. 7.5 x 10-5 S/cm.

ST polyelectrolyte **composite** membrane prodn; phenylenediamine terephthaloyl chloride polyamide electrolyte membrane

IT Polyamides, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(arom.; manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

IT **Membranes,** nonbiological
(**composite;** manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

IT Battery electrolytes
Polyelectrolytes
(manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

IT Alkali metal chlorides
Alkaline earth chlorides
RL: NUU (Other use, unclassified); USES (Uses)
(manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

IT 24991-55-7, Polyoxyethylene dimethyl ether
RL: TEM (Technical or engineered material use); USES (Uses)
(electrolyte; manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

IT 10043-52-4, Calcium chloride, uses
RL: NUU (Other use, unclassified); USES (Uses)
(manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

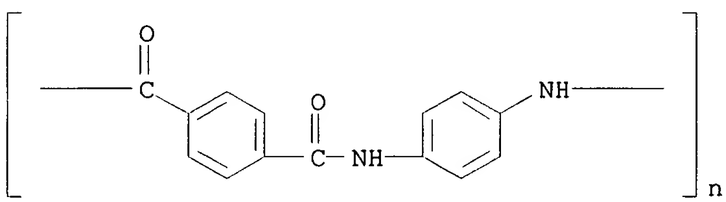
IT **24938-64-5,** Poly(p-phenylene terephthalamide) **24991-08-0**, Poly(p-benzamide) **25035-37-4,** Poly(p-phenylene terephthalamide) **25136-77-0,** p-Aminobenzoic acid homopolymer **26123-25-1,** 2,6-Dichloro p-phenylenediamine-p-phenylenediamine-terephthaloyl chloride copolymer **27289-80-1,** p-Phenylenediamine-2,6-naphthalenedicarboxylic acid copolymer **27307-20-6,** 2,6-Naphthalenedicarboxylic acid-p-Phenylenediamine copolymer, sru **27554-68-3,** 2-Chloro-p-phenylenediamine-terephthalic acid copolymer **29153-47-7,** 4,4'-Diaminobenzanilide-terephthalic acid copolymer **29153-47-7,** 4,4'-Diaminobenzanilide-terephthalic acid copolymer, sru 37357-07-6 **65205-95-0** **88417-35-0,** 4,4'-Biphenylenedicarboxylic acid-p-phenylenediamine copolymer
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of arom. polyamide polyelectrolyte **composite** **membranes** with high **ion** **cond.** and mech. strength)

IT 14283-07-9

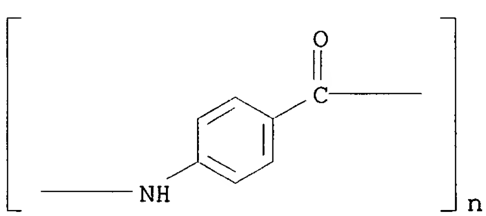
RL: TEM (Technical or engineered material use); USES (Uses)
(manuf. of arom. polyamide polyelectrolyte **composite membranes** with high **ion cond.** and mech. strength)

IT **24938-64-5**, Poly(p-phenylene terephthalamide) **24991-08-0**, Poly(p-benzamide) **25035-37-4**, Poly(p-phenylene terephthalamide) **25136-77-0**, p-Aminobenzoic acid homopolymer **26123-25-1**, 2,6-Dichloro p-phenylenediamine-p-phenylenediamine-terephthaloyl chloride copolymer **27289-80-1**, p-Phenylenediamine-2,6-naphthalenedicarboxylic acid copolymer **27307-20-6**, 2,6-Naphthalenedicarboxylic acid-p-Phenylenediamine copolymer, sru **27554-68-3**, 2-Chloro-p-phenylenediamine-terephthalic acid copolymer **29153-47-7**, 4,4'-Diaminobenzanilide-terephthalic acid copolymer **65205-95-0** **88417-35-0**, 4,4'-Biphenylenedicarboxylic acid-p-phenylenediamine copolymer
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manuf. of arom. polyamide polyelectrolyte **composite membranes** with high **ion cond.** and mech. strength)

RN 24938-64-5 HCAPLUS
CN Poly(imino-1,4-phenyleneiminocarbonyl-1,4-phenylenecarbonyl) (9CI) (CA INDEX NAME)



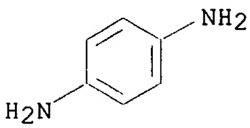
RN 24991-08-0 HCAPLUS
CN Poly(imino-1,4-phenylenecarbonyl) (9CI) (CA INDEX NAME)



RN 25035-37-4 HCAPLUS
CN 1,4-Benzenedicarboxylic acid, polymer with 1,4-benzenediamine (9CI) (CA INDEX NAME)

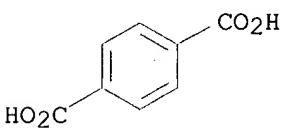
CM 1

CRN 106-50-3
CMF C6 H8 N2



CM 2

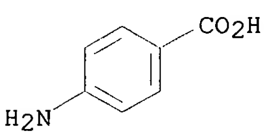
CRN 100-21-0
CMF C8 H6 O4



RN 25136-77-0 HCAPLUS
CN Benzoic acid, 4-amino-, homopolymer (9CI) (CA INDEX NAME)

CM 1

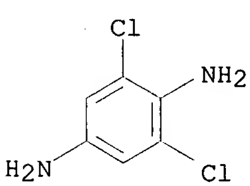
CRN 150-13-0
CMF C7 H7 N O2



RN 26123-25-1 HCAPLUS
CN 1,4-Benzenedicarbonyl dichloride, polymer with 1,4-benzenediamine and 2,6-dichloro-1,4-benzenediamine (9CI) (CA INDEX NAME)

CM 1

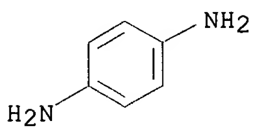
CRN 609-20-1
CMF C6 H6 Cl2 N2



CM 2

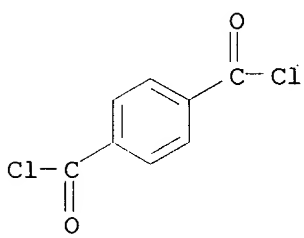
CRN 106-50-3

CMF C6 H8 N2



CM 3

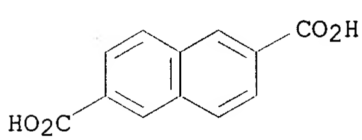
CRN 100-20-9
CMF C8 H4 Cl2 O2



RN 27289-80-1 HCAPLUS
CN 2,6-Naphthalenedicarboxylic acid, polymer with 1,4-benzenediamine (9CI)
(CA INDEX NAME)

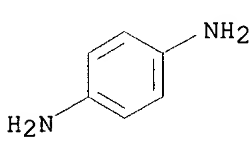
CM 1

CRN 1141-38-4
CMF C12 H8 O4



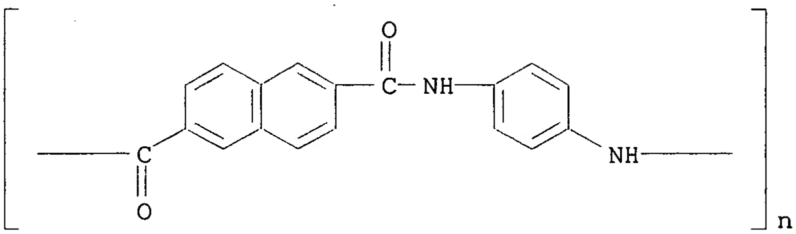
CM 2

CRN 106-50-3
CMF C6 H8 N2



RN 27307-20-6 HCAPLUS
CN Poly(imino-1,4-phenyleneiminocarbonyl-2,6-naphthalenediylcarbonyl) (9CI)

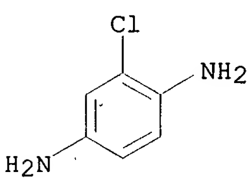
(CA INDEX NAME)



RN 27554-68-3 HCAPLUS
CN 1,4-Benzenedicarboxylic acid, polymer with 2-chloro-1,4-benzenediamine (9CI) (CA INDEX NAME)

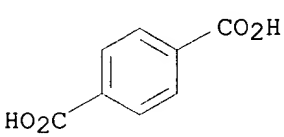
CM 1

CRN 615-66-7
CMF C6 H7 Cl N2



CM 2

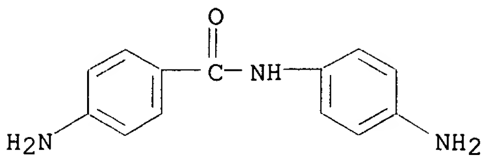
CRN 100-21-0
CMF C8 H6 O4



RN 29153-47-7 HCAPLUS
CN 1,4-Benzenedicarboxylic acid, polymer with 4-amino-N-(4-aminophenyl)benzamide (9CI) (CA INDEX NAME)

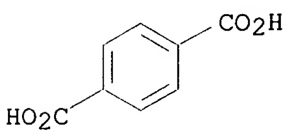
CM 1

CRN 785-30-8
CMF C13 H13 N3 O

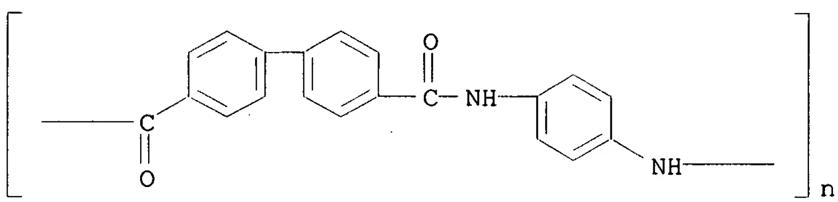


CM 2

CRN 100-21-0
CMF C8 H6 O4



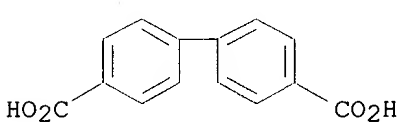
RN 65205-95-0 HCAPLUS
CN Poly(imino-1,4-phenyleneiminocarbonyl[1,1'-biphenyl]-4,4'-diylcarbonyl) (9CI) (CA INDEX NAME)



RN 88417-35-0 HCAPLUS
CN [1,1'-Biphenyl]-4,4'-dicarboxylic acid, polymer with 1,4-benzenediamine (9CI) (CA INDEX NAME)

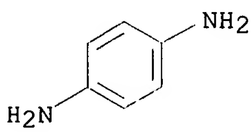
CM 1

CRN 787-70-2
CMF C14 H10 O4



CM 2

CRN 106-50-3
CMF C6 H8 N2



L63 ANSWER 48 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1997-259924 JAPIO
TI **COMPOSITE POLYMER ELECTROLYTIC** FILM
IN ICHINO TOSHIHIRO; TAKESHITA YUKITOSHI; YAMAMOTO FUMIO; KATO HIROSHI; MUSHIAKI NAOFUMI; WANI TAKAYUKI
PA NIPPON TELEGR & TELEPH CORP <NTT>
JAPAN GORE TEX INC
PI JP 09259924 A 19971003 Heisei
AI JP 1996-94653 (JP08094653 Heisei) 19960326
PRAI JP 1996-94653 19960326
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997
IC ICM H01M010-40
ICS H01M006-18
AB PROBLEM TO BE SOLVED: To provide a polymer **solid** electrolyte which has its high **ion conductivity** and mechanical strength.
SOLUTION: This film is so form as to carry a polymer gel made of organic electrolyte and polymer in the internal fine pore of an expanded porous polytetra fluoro-ethylene. In this case, the polymer component of the polymer gel has a bridge structure, the structural formula is preferably include a copolymer of compounds expressed by: R<SB>1</SB> R<SB>2</SB> C=CR<SB>3</SB> COOR<SB>4</SB> or R<SB>1</SB> R<SB>2</SB> C=CR<SB>3</SB> OCOR<SB>4</SB> (each R is the same or different and hydrogen or organic group of valency 1.
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L63 ANSWER 49 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:249804 HCAPLUS
DN 126:306123
TI All solid-state electrochromic window based on poly(aniline N-butylsulfonate)s
AU Kim, Eunkyoung; Lee, Kwang-Yong; Lee, Myong-Hoon; Shin, Jae-Sup; Rhee, Suh Bong
CS Advanced Polymer Division, KRICT, P.O. Box 107, Yusung, Taejeon, 305-600, S. Korea
SO Synthetic Metals (1997), 85(1-3), 1367-1368
CODEN: SYMEDZ; ISSN: 0379-6779
PB Elsevier
DT Journal
LA English
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 52, 73
AB All solid electrochromic windows were assembled by using an anodically coloring poly(aniline N-butylsulfonate) **ion conducting** polymer electrolyte, and a cathodically coloring tungsten trioxide. **Ion conducting** polymers were prepd. via photocrosslinking reactions of poly(ethylene glycol)-modified methacrylates with tripropylene glycol diacrylate in the presence of a photoinitiator and $LiClO_4$. Cyclic life and the color contrast of the all solid state window were enhanced by the introduction of styrene and Bu methacrylate, and H^+-conducting Nafion into the electrolyte. Lifetime tests show that the electrochromic window could support more than 2

.times. 103 cycles, of 60 s duration.
ST electrochromic window polyaniline butylsulfonate; polymer electrolyte electrochromic window
IT Polyamines
RL: DEV (Device component use); **POF (Polymer in formulation);** PRP (Properties); USES (Uses)
(assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)
IT Windows
(electrochromic; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)
IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(fluorine- and sulfo-contg., ionomers, Nafion; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane** contg.)
IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(fluorine-contg., sulfo-contg., ionomers, Nafion; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane** contg.)
IT **Ionic conductivity**
(of radiation cured solid polymer electrolyte for assembly of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate))
IT Polymerization
(photopolymn.; in prepn. of **polymer electrolyte membrane** for assembly of all **solid**-state electrochromic window based on redox stable poly(aniline N-butylsulfonate))
IT Fluoropolymers, uses
Fluoropolymers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(polyoxyalkylene-, sulfo-contg., ionomers, Nafion; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane** contg.)
IT Ionomers
RL: NUU (Other use, unclassified); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-contg., Nafion; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane** contg.)
IT Electrochromic devices
(windows; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)
IT **154711-76-9**
RL: DEV (Device component use); **POF (Polymer in formulation);**

PRP (Properties); USES (Uses)
(assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)

IT 1314-35-8, Tungsten trioxide, uses
RL: NUU (Other use, unclassified); USES (Uses)
(assembly of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)

IT 7439-93-2D, Lithium, complexes with polyethylene glycol methacrylate polymers, properties 185980-87-4D, lithium complex **188430-09-3D**, lithium complex
RL: DEV (Device component use); **POF (Polymer in formulation)**;
PRP (Properties); USES (Uses)
(polymer electrolyte; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)

IT **154711-76-9**
RL: DEV (Device component use); **POF (Polymer in formulation)**;
PRP (Properties); USES (Uses)
(assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)

RN 154711-76-9 HCAPLUS
CN 1-Butanesulfonic acid, 4-(phenylamino)-, monosodium salt, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 154711-75-8
CMF C10 H15 N O3 S . Na

$HO_3S-(CH_2)_4-NHPh$

● Na

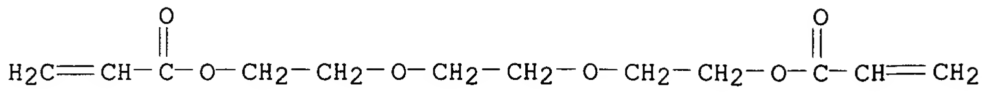
IT **188430-09-3D**, lithium complex
RL: DEV (Device component use); **POF (Polymer in formulation)**;
PRP (Properties); USES (Uses)
(polymer electrolyte; assembly and electrochromic properties of all solid-state electrochromic window based on redox stable poly(aniline N-butylsulfonate) and radiation-cured **polymer electrolyte membrane**)

RN 188430-09-3 HCAPLUS
CN 2-Propenoic acid, (1-methyl-1,2-ethanediyl)bis[oxy(methyl-2,1-ethanediyl)] ester, polymer with ethenylbenzene and .alpha.-(2-methyl-1-oxo-2-propenyl)-.omega.-methoxypoly(oxy-1,2-ethanediyl), block, graft (9CI) (CA INDEX NAME)

CM 1

CRN 42978-66-5
CMF C15 H24 O6

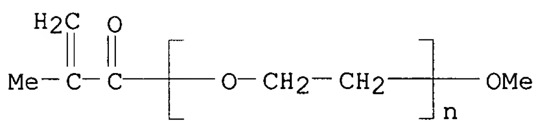
CCI IDS



3 (D1-Me)

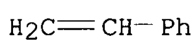
CM 2

CRN 26915-72-0
CMF (C2 H4 O)n C5 H8 O2
CCI PMS



CM 3

CRN 100-42-5
CMF C8 H8

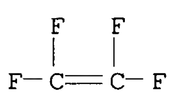


L63 ANSWER 50 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:585866 HCAPLUS
DN 127:265480
TI Properties of radiation grafted membranes for fuel cell applications
AU Haas, O.; Brack, H. P.; Buchi, F. N.; Gupta, B.; Scherer, G. G.
CS Paul Scherrer Institut, Elektrochemie, Villigen, CH-5232, Switz.
SO New Materials for Fuel Cell and Modern Battery Systems II, Proceedings of the International Symposium on New Materials for Fuel Cell and Modern Battery Systems, 2nd, Montreal, July 6-10, 1997 (1997), 836-849. Editor(s): Savadogo, O.; Roberge, P. R. Publisher: Ecole Polytechnique de Montreal, Montreal, Que.
CODEN: 64ZAAP
DT Conference
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**, 76
AB Radiation grafting monomers onto a base polymer film and subsequent sulfonation of the grafted component is a viable method to synthesize novel proton-conducting membranes. The application of these **membranes** as **solid polymer electrolytes** in PEFCs requires a comprehensive characterization of membrane properties. The properties of these membranes were studied as a function of the degree of grafting and extent of crosslinking, and they

are presented and discussed in this paper.
ST radiation grafted polymer membrane fuel cell
IT **Ionic conductivity**
(proton; radiation grafted membranes for fuel cell applications)
IT Electric resistance
Fuel cell electrolytes
Fuel cell separators
(radiation grafted membranes for fuel cell applications)
IT **100829-37-6 110830-83-6**, Hexafluoropropylene-styrene-tetrafluoroethylene graft copolymer
RL: DEV (Device component use); USES (Uses)
(radiation grafted membranes for fuel cell applications)
IT **100829-37-6 110830-83-6**, Hexafluoropropylene-styrene-tetrafluoroethylene graft copolymer
RL: DEV (Device component use); USES (Uses)
(radiation grafted membranes for fuel cell applications)
RN 100829-37-6 HCAPLUS
CN Benzene, ethenyl-, polymer with ethene and tetrafluoroethene (9CI) (CA INDEX NAME)

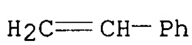
CM 1

CRN 116-14-3
CMF C2 F4



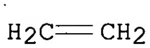
CM 2

CRN 100-42-5
CMF C8 H8



CM 3

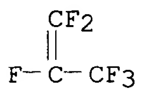
CRN 74-85-1
CMF C2 H4



RN 110830-83-6 HCAPLUS
CN Benzene, ethenyl-, polymer with 1,1,2,3,3,3-hexafluoro-1-propene and tetrafluoroethene, graft (9CI) (CA INDEX NAME)

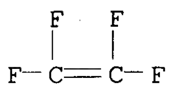
CM 1

CRN 116-15-4
CMF C3 F6



CM 2

CRN 116-14-3
CMF C2 F4



CM 3

CRN 100-42-5
CMF C8 H8

$H_2C{=}CH{-}Ph$

L63 ANSWER 51 OF 82 RAPRA COPYRIGHT 2002 RAPRA
AN R:580368 RAPRA FS Rapra Abstracts
TI POLYETHER, POLY(N,N-DIMETHYLACRYLAMIDE), AND LITHIUM PERCHLORATE **COMPOSITE POLYMERIC POLYMERIC ELECTROLYTES.**
AU Wieczorek W; Zalewska A; Raducha D; Florjanczyk Z; Stevens J R; Ferry A; Jacobsson P (Guelph,University; Umea,University)
SO Macromolecules 29, No.1, 1st Jan.1996, p.143-55
ISSN: 0024-9297
PY 1996
DT Journal
LA English
AB The results of detailed studies of the **ionic conductivity,** ultrastructure, and morphology of the title electrolytes are presented and discussed. They were studied by DSC, FTIR, impedance analysis, Fourier transform Raman, SEM, and X-ray energy dispersive studies. Highly crystalline PEO and amorphous or low-crystalline oxymethylene-linked PEO were used as polyether matrices for **composite** electrolytes. Interactions of lithium cations with polyether oxygens and the carbonyl oxygens of the filler poly(N,N-dimethylacrylamide) lead to the formation of various types of complexes. The order-disorder transition temperature calculated on the basis of a semiempirical model was equal to the onset temperature of the melting peak of the crystalline PEO for semicrystalline electrolytes or equal to 1.2 times the Tg of the polyether-lithium perchlorate electrolyte for the corresponding amorphous systems. Assuming that the enhanced conductivity of these **composite polymer electrolytes** is associated with interphase phenomena, the conductivity results were analysed in terms of a model based on effective medium theory. 35 refs.
CC 43C521; 43C521C511; 6M; 966; 981; 911

SC *QM; KS; KN
CT COMPLEX FORMATION; **COMPOSITE**; CRYSTALLINITY; DATA; DIFFERENTIAL THERMAL ANALYSIS; DSC; ELASTOMER; ELECTROLYTE; ETHYLENE OXIDE COPOLYMER; ETHYLENE OXIDE POLYMER; FOURIER TRANSFORM; FOURIER TRANSFORM INFRARED SPECTROSCOPY; FTIR; GLASS TRANSITION TEMPERATURE; GRAPH; INTERMOLECULAR INTERACTION; INTRAMOLECULAR INTERACTION; **IONIC CONDUCTIVITY**; MELTING POINT; ORDER-DISORDER TRANSITION; PEO; PLASTIC; POLYDIMETHYL ACRYLAMIDE; POLYETHER; POLYETHYLENE OXIDE; POLYMERIC FILLER; RAMAN SPECTROSCOPY; RUBBER; SCANNING ELECTRON MICROSCOPY; SEM; **SOLID**; TABLES; TECHNICAL; TG; THERMOPLASTIC
SHR ELECTROLYTES,**solid**,PEO,dimethylacrylamide polymers, **ionic conductivity**,thermal properties
GT CANADA; SCANDINAVIA; SWEDEN; WESTERN EUROPE

L63 ANSWER 52 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 970039708 JICST-EPlus
TI High Current Density **Solid** Polymer Electrolyte Water Electrolysis.
AU NISHIMURA YASUO; YASUDA KAZUAKI; FUJIWARA NAOKO; ASAKA KINJI; OGURO KEISUKE
CS Osaka National Res. Inst. Agency Ind. Sci. and Technol.
SO Soda Kogyo Gijutsu Toronkai Koen Yoshishu, (1996) vol. 20th, pp. 49-52. Journal Code: X0815A (Fig. 3, Ref. 3)
CY Japan
DT Conference; Short Communication
LA Japanese
STA New
AB We have investigated on high current density water electrolysis using electrocatalyst-**solid polymer electrolyte membrane composite**. Electrocatalyst-membrane **composite** (Pt/Nafion 117/Pt, Ir) was prepared by chemical reduction of metal complex at the surface of the membrane. The cell was run up to around 13A/cm2 of current density when water was suplied at only anodic side. In the range from 1A/cm2 to 13A/cm2 of current density, steep slope of the curve of cell voltage versus current density was not observed. The amount of water molecules accompanied by proton was almost same from 1A/cm2 to 10A/cm2 of current density. It is thought that water amount in the membrane was kept during water electrolysis to keep **ion-conductivity**. (author abst.)
CC YB020700; XE02030E (661.9; 66.087.7.02)
CT **solid** electrolyte; polyelectrolyte; water; electrolysis; ion exchange membrane; current density; titanium; sintered body; platinum plating; hydrogen; fluorocarbon resin; cation exchange resin
BT electrolyte; matter; functional polymer; macromolecule; electrochemical reaction; chemical reaction; ion exchanger(material); membrane and film; density; 4A group element; transition metal; metallic element; element; fourth row element; object; noble metal plating; plating; surface treatment; treatment; thermoplastic; plastic; fluorine-containing polymer; halogen-containing polymer; polymer; ion exchange resin

L63 ANSWER 53 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1995-138390 JAPIO
TI POLYMERIC ION EXCHANGE MEMBRANE AND ITS PRODUCTION
IN MIZUNO SEIJI
PA TOYOTA MOTOR CORP
PI JP 07138390 A 19950530 Heisei
AI JP 1993-314162 (JP05314162 Heisei) 19931119
PRAI JP 1993-314162 19931119
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995
IC ICM C08J005-22

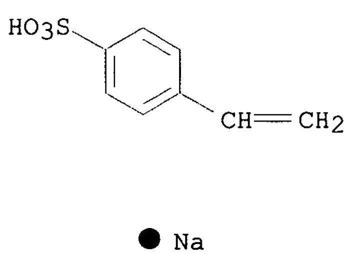
ICS B01J047-12; B29C047-06; B29C047-56; B29C069-00
ICA C25B013-08
AB PURPOSE: To obtain an ion exchange membrane of improved **ionic conductivity** by orienting molecular chains constituting main chains of a polymer resin having ion exchange groups for cations or anions along the direction of thickness of the membrane.
CONSTITUTION: Tetrafluoroethylene and fluorosulfonyl-containing perfluorovinyl ether are simultaneously copolymerized and **extruded** to form a columnar bulk of a sulfonic-group-containing fluorine-containing sulfonic acid polymer resin and to uniformly orient molecular chains of 10C constituting the main chains of the resin along the direction of **extrusion**. The columnar bulk is cut in the direction rectangular to the direction of **extrusion** to form thin films. The thin films are subjected to hydrolysis to make **electrolyte** films 10 (**polymeric** ion exchange **membranes**). In each electrolyte membrane 10, the terminal is branched to side chains of each molecular chain 10C and found totally 10X sulfonic groups and is surrounded with a cluster. Carbon particles 28 are applied to the surface of the electrolyte membrane 10, and the entire is sandwiched between an anode 20 and a cathode 30 and hot-pressed to obtain a high-performance fuel battery.

L63 ANSWER 54 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:61987 HCAPLUS
DN 124:178178
TI Transport behavior of electrolytes through charged mosaic **composite** membranes
AU Ishizu, Koji; Iwade, Masaya
CS Department of Polymer Science, Tokyo Institute of Technology, Tokyo, 152, Japan
SO Polymer-Plastics Technology and Engineering (1995), 34(6), 891-915
CODEN: PPTEC7; ISSN: 0360-2559
PB Dekker
DT Journal
LA English
CC 38-3 (**Plastics Fabrication** and Uses)
AB For prepn. of charged mosaic **composite** membranes, a template pattern with alternating poly(4-vinylpyridine) (P4VP)/poly(vinyl alc.) (PVA) lamellae was fabricated on a microporous membrane by **casting** 4-vinylpyridine (4VP)-vinyl alc. (VA) graft copolymer from a water/1-propanol mixt. After a treatment involving the binding of the microporous membrane with the graft copolymer and also domain fixing of the PVA phases, a dil. soln. of sodium p-styrenesulfonate (SSS)-VA graft copolymer/P4VP binary blend was **cast** on this template surface. After chem. treatments (introduction of a pos. charge and domain fixing of ion-exchange regions), the transport of KCl and selective transport of a KCl-sucrose mixt. through the charged mosaic **composite** membrane was obsd. Other mosaic membranes were formed from polyacrylic acid and quaternized P4VP; transport of KCl and L-phenylalanine through these membranes was examd.
ST **electrolyte** transport **polymeric** mosaic **membrane**; polyvinylpyridine polystyrenesulfonate membrane electrolyte transport; polyacrylic acid polyvinylpyridine membrane transport
IT Electrolytes
(transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)
IT Electric **conductivity** and **conduction**
(**ionic,** transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)

IT 9003-01-4, Poly(acrylic acid) **25704-18-1**, Poly(sodium p-styrenesulfonate)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blends with poly(vinylpyridine); transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)
IT 25232-41-1, Poly(4-vinylpyridine)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blends with polystyrenesulfonate or poly(acrylic acid); transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)
IT 63-91-2, L-Phenylalanine, processes 7447-40-7, Potassium chloride, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(electrolyte; transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)
IT 57-50-1, Sucrose, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(potassium chloride mixts., electrolyte; transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)
IT **25704-18-1**, Poly(sodium p-styrenesulfonate)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(blends with poly(vinylpyridine); transport of **electrolytes** through charged **polymer** blend mosaic **membranes**)
RN 25704-18-1 HCAPLUS
CN Benzenesulfonic acid, 4-ethenyl-, sodium salt, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 2695-37-6
CMF C8 H8 O3 S . Na

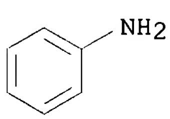


L63 ANSWER 55 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:572806 HCAPLUS
DN 123:13637
TI Polymer film battery using new type electrode
AU Ohsawa, Toshiyuki; Kimura, Okitoshi; Kabata, Toshiyuki; Katagiri, Nobuo; Fujii, Toshishige; Hayashi, Yoshitaka
CS Research & Development Center, Ricoh Company, Ltd., Yokohama, 223, Japan
SO Proceedings - Electrochemical Society (1995), 94-28(Rechargeable Lithium and Lithium-Ion Batteries), 481-6
CODEN: PESODO; ISSN: 0161-6374
PB Electrochemical Society

DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**
AB Polymer film batteries were fabricated based on the conductive polymers, namely, polymer composite consisted of sol. polyaniline and V2O5 as the cathode and **ionic conductive** polymer gel as the **solid** polymer electrolyte. Electrochem. behavior of the polymer composite electrode and the performance of Li ion type polymer film battery using this **composite** electrode and **polymer electrolyte** were investigated. We have prepd. the composite polymer electrode with the bi-ion transfer mechanism which have high energy d. and high reliability by the coating method of a reduced polyaniline and V oxide material. We have prepd. the free-standing highly **ion-conducting** film of gel-type **solid** polymer electrolyte by photo-**solidification** of the mixt. f solvent, Li salt, acrylate monomer and initiator. We have developed a Li ion type polymer film battery with high performance using graphite-like C as anode and this polymer technol.
ST polymer film battery
IT Battery electrolytes
(**ionic conductive** polymer gel; polymer film battery using new type electrode)
IT Electrodes
(battery, polymer film battery using new type electrode)
IT 1314-62-1, Vanadium pentoxide, uses **25233-30-1**, Polyaniline
152218-76-3
RL: DEV (Device component use); USES (Uses)
(polymer film battery using new type electrode)
IT **25233-30-1**, Polyaniline
RL: DEV (Device component use); USES (Uses)
(polymer film battery using new type electrode)
RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



L63 ANSWER 56 OF 82 RAPRA COPYRIGHT 2002 RAPRA
AN R:598390 RAPRA FS Rapra Abstracts
TI **IONICALLY CONDUCTING** POLYMERS: NEW MATERIALS FOR APPLICATIONS IN HIGH ENERGY DENSITY BATTERIES.
AU Scrosati B (Rome,Universita La Sapienza)
SO Chimica e l'industria 77, No.5, May 1995, p.285-90
PY 1995
DT Journal
LA English
AB Applications of **polymer electrolyte membranes** in high energy lithium storage batteries are discussed. It is shown that electrolytes obtained by the formation of complexes between lithium salts

and polymers such as PEO containing lithium coordinating atoms cannot provide high ionic transport at temperatures much below 100C. This can be overcome by using gel type membranes formed by trapping into a PMMA or PAN matrix a solution of a lithium salt in a propylene carbonate/ethylene carbonate mixture or butyrolactone. These show high conductivity even at temperatures well below ambient. The problem of passivation of the lithium metal electrode by reaction with the electrolyte can be overcome by the use of rocking chair batteries in which the lithium anode is replaced by another insertion compound capable of accepting and exchanging large quantities of lithium ions. 20 refs.

CC 42C35121; 42C391; 43C521; 6123; 6E4.12; 6M; 981

SC *QF; KK; KN; KS; OB; QM; UI

CT ACRYLONITRILE POLYMER; AMORPHOUS; ANION; ANODE; AUTOMOTIVE APPLICATION; BAND STRUCTURE; BATTERY; CAR; **CASTING**; CATHODE; CATION; CHAIN ENTANGLEMENT; CHAIN FLEXIBILITY; CHAIN FOLDING; COMPANY; COMPLEX; CROSSLINK; CRYSTALLINITY; DATA; ELECTRIC VEHICLE; ELECTRICAL APPLICATION; ELECTRICAL CONDUCTIVITY; ELECTRICAL PROPERTIES; ELECTROCHEMICAL; ELECTROCHEMICAL CELL; ELECTRODE; ELECTROLYTE; ELECTRONIC BAND STRUCTURE; ELECTRONIC CONDUCTIVITY; ELECTRONIC PROPERTIES; ELECTRONIC STRUCTURE; ENERGY CONTENT; ENERGY DENSITY; ENVIRONMENT; ETHYLENE OXIDE POLYMER; FILM; GEL; GELLING; GRAPH; INTERACTION; INTERCALATION; ION EXCHANGE; ION HOPPING; ION INTERACTION; ION MOBILITY; ION TRANSPORT; **IONIC CONDUCTIVITY**; LOW TEMPERATURE; MECHANICAL PROPERTIES; MEMBRANE; METAL ALLOY; MOLECULAR STRUCTURE; MORPHOLOGICAL PROPERTIES; PAN; PASSIVATION; PEO; PHASE DIAGRAM; PLASTIC; PMMA; POLYACRYLONITRILE; POLYELECTROLYTE; POLYETHYLENE OXIDE; POLYMETHYL METHACRYLATE; RECHARGEABLE; ROCKING CHAIR DEVICE; ROOM TEMPERATURE; SOLUTION; SOLVENT; SPECIFIC CAPACITY; SPECIFIC DENSITY; TABLES; TECHNICAL; TEMPERATURE; THERMAL PROPERTIES; THERMOPLASTIC; THICKNESS; THIN FILM; TRANSITION TEMPERATURE

NPT ACETONITRILE; ALUMINIUM; BUTYROLACTONE; ETHYLENE CARBONATE; FERROUS SULPHIDE; LITHIUM; LITHIUM ION; LITHIUM PERCHLORATE; LITHIUM SALT; PROPYLENE CARBONATE; SODIUM; SULPHUR; ALUMINUM; FERROUS SULFIDE; SULFUR

SHR ELECTRIC BATTERIES,membranes,polyelectrolytes,**ionic conductivity**,PEO,PAN,PMMA,gels,electronic properties; MEMBRANES,PEO,PAN,PMMA,gels,electric batteries,polyelectrolytes,electronic properties,**ionic conductivity**; POLYELECTROLYTES,membranes,electric batteries,PEO,PAN,PMMA,gels,electronic properties,**ionic conductivity**; **IONIC CONDUCTIVITY**,membranes,electric batteries,polyelectrolytes,PEO,PAN,PMMA,gels; ELECTRONIC PROPERTIES,PEO,PAN,PMMA,gels,polyelectrolytes,electric batteries,membranes; ETHYLENE OXIDE POLYMERS,electric batteries,membranes,polyelectrolytes,electronic properties,**ionic conductivity**; GELS,PAN,PMMA,electric batteries,membranes,polyelectrolytes,electronic properties,**ionic conductivity**; ACRYLONITRILE POLYMERS,gels,membranes,polyelectrolytes,electronic properties,**ionic conductivity**,electric batteries; METHYL METHACRYLATE POLYMERS,gels,polyelectrolytes,electric batteries,membranes,electronic properties,**ionic conductivity**

GT EUROPEAN COMMUNITY; EUROPEAN UNION; ITALY; WESTERN EUROPE

L63 ANSWER 57 OF 82 JICST-EPlus COPYRIGHT 2002 JST

AN 950532920 JICST-EPlus

TI **Ionic Conductance** Behavior of Polymeric **Solid** Electrolytes Containing Cerium Ion.

AU MORITA MASAYUKI; MURAO KAORI; ISHIKAWA MASASHI; MATSUDA YOSHIHARU

CS Yamaguchi Univ., Fac. of Eng.

SO Kidorui (Rare Earths), (1995) no. 26, pp. 202-203. Journal Code: L0027A (Fig. 3)

CODEN: KIDOEP; ISSN: 0910-2205
CY Japan
DT Conference; Article
LA Japanese
STA New
AB **Polymeric solid electrolyte composites** were prepared from poly(ethylene oxide)-based polymer matrices and cerium(III) perchlorate. The **Ionic conductivity** of the **composite** films was measured by an AC method. The conductivity depended on the film composition, and the maximum value was about 10-3 S cm-1 at 60 .DEG.C.. The ionic behavior in the **composite** was investigated by voltammetry using a microelectrode. (author abst.)
CC CG02024U; BL06021L (544.23-16:535/538; 539.219.3)
CT polyelectrolyte; **solid** electrolyte; **ionic conduction**; cerium compound; perchlorate; polymer complex; electrical conductivity; polymer membrane; cyclic voltammetry; cerium; superionic conductor; polyethylene oxide
BT functional polymer; macromolecule; electrolyte; matter; electric conduction; electrical property; rare earth element compound; transition metal compound; chlorine oxoate; chlorine compound; halogen compound; halogen oxoate; oxoate; oxygen compound; oxygen group element compound; complex(substance); ratio; transport coefficient; coefficient; membrane and film; voltammetry; instrumental analysis; analysis(separation); analysis; lanthanide; rare earth element; transition metal; metallic element; element; polyalkylene oxide; thermoplastic; plastic; polyether; polymer

L63 ANSWER 58 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 1994-077842 [10] WPIX
DNN N1994-060775 DNC C1994-035501
TI **Ionically conductive** solid **polymer electrolyte** - comprises **composite** of organic **polymer** having functional gp. of crown ether structure and contg. a metallic salt.
DC A18 A85 L03 X12 X16
PA (SONY) SONY CORP
CYC 1
PI JP 06028914 A 19940204 (199410)* 8p H01B001-06
ADT JP 06028914 A JP 1992-334769 19921215
PRAI JP 1992-122276 19920514
IC ICM H01B001-06
ICS C08F008-00; C08K003-00; C08L101-00; H01M006-18
AB JP 06028914 A UPAB: 19940421
An **ionically conductive** solid polymer electrolyte comprises a **composite** product of an organic polymer having a functional gp. of a crown ether structure and contg. a metallic salt.

Pref. the (co)polymer comprises 5-100% crown ether (4-vinylbenzo-15-crown-5 or 4-vinylbenzo-18-crown-6) and 95-0% copolymerisable monomer (e.g., acrylic monomer (e.g., CH2=CHCOOH, CH2=CHCOOM where M = Li+, Na+ or K+, CH2=CHCOOR where R = an alkyl or CH2CHCOO(CH2CH2O)n-CH3 where n = 1-23), methacrylic monomer (e.g., CH2CCH3COOH, CH2=CCH3COOM, CH2=CCH3COOR or CH2=CCH3COO(CH2CH2O)n-CH3) or other monomer (e.g. CH2 = C(COO(CH2CH2O)n-CH3)2, CH2=CH(C6H5), CH2=CHCN, CH2-CHCONH2 or CH2=CH(C6H5SO3Na)). The (co)polymer is opt. blended with other compatible polymer (e.g., polyethylene oxide, (CH2-CCH3COOLi)n or polymethyl methacrylate). The metal salt is e.g. LiBr, LiI, LiSCN, LiBF4, LiAsF4, LiClO4, LiCF3SO4 or LiPF6 and used in an amt. = 0.1-20 wt.% of the organic (co)polymer. The solid electrolyte is prepd. by **casting** a soln. of the organic (co)polymer and the metallic salt in an organic

polar solvent (e.g. ethanol, acetone, acetonitrile or dimethylformamide) on a glass base board or smooth Teflon base board, evaporating the solvent at 60 deg.C in N2 atmos. in a thermostat and heating the coated base board in vacuo.

ADVANTAGE - The polymer electrolyte has high **ionic conductivity** at room temp. and high film workability.

Dwg.0/0

FS CPI EPI
FA AB
MC CPI: A09-A03; A12-E09; A12-M02; L03-A02C; L03-E01C
EPI: X12-D01C1; X16-A02; X16-J01A

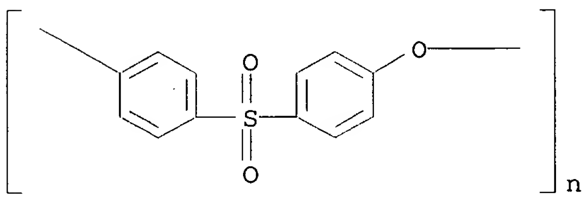
L63 ANSWER 59 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:233208 HCAPLUS
DN 122:11707
TI Electrooptical properties of poly(vinyl alcohol)/liquid crystal **composite** films with added photocured polymers
AU Ono, Hiroshi; Kawatsuki, Nobuhiro
CS Kuraray Co., Ltd., Kurashiki, 710, Japan
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (1994), 33(11), 6268-72
CODEN: JAPNDE; ISSN: 0021-4922
PB Japanese Journal of Applied Physics
DT Journal
LA English
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 37, 75, 76
AB Electrooptical properties were studied on a new type of **polymer/ liq. crystal** (LC) **composite** film composed of a poly(vinyl alc.) (Poval 205, PVA), LC, and a photocured polymer. The **composite** films were prepd. by **casting** the PVA/LC emission with a mixt. of benzyl methacrylate (BzMA) with **perfluorooctylethyl** acrylate (FA-108) followed by photocuring, resulting in a low-driving voltage of 19 Vrms, a rapid turn-on time of 0.2 ms, and a rapid turn-off time of 11 ms. The results cannot be entirely explained by the change in droplet shape and size. It was suggested that photocurable monomers polymd. at the interface which caused change in the boundary condition between PVA and the LC.
ST polyvinyl alc liq crystal **composite**; electrooptical **polymer liq crystal composite;** photocured **polymer liq crystal composite**
IT Electric switches and switching
Electrooptical effect
Liquid crystals
Polymer morphology
(electrooptical properties of poly(vinyl alc.)/liq.-crystal **composite** films with added photocured polymers)
IT Fluoropolymers
RL: MOA (Modifier or additive use); USES (Uses)
(photocured; electrooptical properties of poly(vinyl alc.)/liq.-crystal **composite** films with added photocured polymers)
IT 122463-72-3, PVA 205
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(electrooptical properties of poly(vinyl alc.)/liq.-crystal **composite** films with added photocured polymers)
IT 104626-00-8, ZLI 2061
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(liq. crystal; electrooptical properties of poly(vinyl alc.)/liq.-crystal **composite** films with added photocured polymers)

IT 25085-83-0, Benzyl methacrylate homopolymer 74049-08-4, **Perfluorooctylethyl** acrylate homopolymer
RL: MOA (Modifier or additive use); USES (Uses)
(photocured; electrooptical properties of poly(vinyl alc.)/liq.-crystal **composite** films with added photocured polymers)

L63 ANSWER 60 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:401699 HCAPLUS
DN 122:172629
TI Development of membranes for alkaline and SPE electrolysis
AU Kerres, Jochen; Eigenberger, Gerhart; Reichle, Sabine; Hetzel, Karin; Schramm, Volker
CS Germany
SO Wasserst. Energietraeger, Kolloq. 1994 Sonderforschungsbereichs 270 Univ. Stuttgart (1994), 69-90 Publisher: VDI, Duesseldorf, Germany.
CODEN: 60ZDA8
DT Conference
LA German
CC 72-9 (Electrochemistry)
Section cross-reference(s): **38**, 49
AB Within the framework of polymer development for alk. **electrolysis**, porous **polymer membranes** of the polymer Polysulfon Udel were successfully developed. The polymer has the necessary thermal and chem. resistance (electrolysis conditions: 90.degree. hot KOH) and a lower elec. resistance (at c.d. 0.1-0.3 A/cm2, the sp. resistance was 1-15 .OMEGA.-cm) for use as a diaphragm. Moreover, the 1st attempts to produce chem. resistant cation-exchanger materials based on Polysulfon Udel for **solid**-polymer electrolysis were carried out. With the new sulfonation process, Polysulfon Udel can be successfully sulfonated. The result was an ion-exchange polymer with good **ion cond**., which partially exceeded even the **ion cond.** of the std. Nafion ion-exchange polymer. The newly developed process is substantially easier and has fewer reaction steps than, for example, the process for manufg. Nafion, so that the ion-exchange polymers produced thereby offer an economical alternative to Nafion, but should exhibit a similarly high resistance to hydrolysis and oxidn.
ST alk **electrolysis membrane solid polymer**; Polysulfon Udel cation exchanger electrolysis
IT Sulfonation
(membranes from sulfonated Polysulfon Udel for alk. and **solid**-polymer electrolyte electrolysis)
IT Cation exchangers
(membranes, development of **membranes** for alk. and **solid**-polymer electrolyte electrolysis)
IT Polysulfones, uses
RL: DEV (Device component use); **POF (Polymer in formulation)**; USES (Uses)
(sulfonated, **membranes** for alk. and **solid**-polymer electrolyte electrolysis)
IT **25667-42-9**
RL: DEV (Device component use); **POF (Polymer in formulation)**; USES (Uses)
(Polysulfon Udel **membranes** for alk. and **solid**-polymer electrolyte electrolysis)
IT 1310-58-3, Potassium hydroxide, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**membranes** for alk. and **solid**-polymer electrolyte

electrolysis)
IT **25667-42-9**
RL: DEV (Device component use); **POF (Polymer in formulation);**
USES (Uses)
(Polysulfon Udel **membranes** for alk. and **solid**
-polymer electrolyte electrolysis)
RN 25667-42-9 HCAPLUS
CN Poly(oxy-1,4-phenylenesulfonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



L63 ANSWER 61 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:285578 HCAPLUS
DN 122:69651
TI Electrically conductive polymer composition
IN Kono, Michiyuki; Mori, Shigeo
PA Daiichi Kogyo Seiyaku Co., Ltd., Japan
SO Can. Pat. Appl., 66 pp.
CODEN: CPXXEB
DT Patent
LA English
IC C08L079-00; C08L063-00; H04M010-36
CC 76-2 (Electric Phenomena)
Section cross-reference(s): **38**
FAN.CNT 1

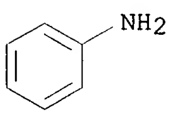
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CA 2081629	AA	19930506	CA 1992-2081629	19921028
	JP 05129162	A2	19930525	JP 1991-288928	19911105
	JP 3265431	B2	20020311		
	JP 05214247	A2	19930824	JP 1992-18903	19920204
	JP 3062563	B2	20000710		
PRAI	JP 1991-288928	A	19911105		
	JP 1992-18903	A	19920204		

AB The elec. conductive polymer compn. of this invention comprises (A) a polyaniline; (B) .gtoreq.1 member selected from the class consisting of homopolymers, block copolymers and random copolymers of alkylene oxide monomers and their crosslinking products; and (C) .gtoreq.1 member selected from the class consisting of protonic acid anions, electron acceptors, alkali metal salts, and alk. earth metal salts. This compn. affords a choice of electronic or **ionic conductance**, or both, according to the intended application. Also, since it is highly processable and flexible, the compn. finds application in secondary batteries and **solid** electrolytic capacitors.
ST elec conductive polymer compn; polyaniline based conductive polymer compn; secondary battery conductive polymer compn; **solid electrolytic** capacitor conductive **polymer compn**
IT Batteries, secondary
(elec. conductive polymer compns. for)
IT Electric conductors, polymeric
(polyaniline-poly(alkylene oxide) compns. contg. dopants)

IT Electric capacitors
(electrolytic, **solid**, elec. conductive polymer compns. for)
IT 104-15-4, p-Toluenesulfonic acid, uses 584-84-9, 2,4-Tolylene diisocyanate 1518-16-7, TCNQ 4098-71-9, Isophorone diisocyanate 7601-89-0, Sodium perchlorate 7791-03-9, Lithium perchlorate 9003-11-6, Ethylene oxide-propylene oxide copolymer 9003-11-6D, Ethylene oxide-propylene oxide copolymer, acryloyl-terminated 14283-07-9 **25233-30-1**, Polyaniline 25322-68-3, Polyethylene oxide 25322-68-3D, Polyethylene oxide, acryloyl-terminated 107628-12-6, 1,2-Epoxybutane-ethylene oxide block copolymer 107628-12-6D, acryloyl-terminated
RL: TEM (Technical or engineered material use); USES (Uses)
(elec. conductive polymer compns. contg.)
IT **25233-30-1**, Polyaniline
RL: TEM (Technical or engineered material use); USES (Uses)
(elec. conductive polymer compns. contg.)
RN 25233-30-1 HCAPLUS
CN Benzenamine, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 62-53-3
CMF C6 H7 N



L63 ANSWER 62 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:450820 HCAPLUS
DN 119:50820
TI Method for producing an ionomer
IN Ross, Robert
PA N.V. Kema, Neth.
SO PCT Int. Appl., 10 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C08J007-12
ICS B29C059-00; B01D067-00
CC 38-2 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 72
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9220728	A1	19921126	WO 1992-NL86	19920508
	W: AT, AU, BB, BG, BR, CA, CH, CS, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, PL, RO, RU, SD, SE, US				
	RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GN, GR, IT, LU, MC, ML, MR, NL, SE, SN, TD, TG				
	NL 9100815	A	19921201	NL 1991-815	19910510
	CA 2100815	AA	19921111	CA 1992-2100815	19920508
	AU 9218745	A1	19921230	AU 1992-18745	19920508
	JP 06507657	T2	19940901	JP 1992-510163	19920508
	JP 3268531	B2	20020325		
	EP 647249	A1	19950412	EP 1992-917395	19920508

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     EP 647249         B1   20020814
         R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE
     AT 222272         E    20020815      AT 1992-917395    19920508
     NO 9304030        A    19931108      NO 1993-4030      19931108
PRAI NL 1991-815       A    19910510
     WO 1992-NL86      A    19920508
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AB An ionomer is produced by (1) providing a plastic (e.g., a polyethylene or polystyrene or PTFE sheet); (2) placing an elec. conducting medium in contact with a plastic surface of the plastic (the surface may have grooves and cavities which may contain contaminants; the reactive medium can be liq. or gaseous and org. or inorg. and can contain reactive components such as O2, O3, SO2, surfactants, salts, etc. for assisting the radical- and ion-forming reactions and oxidn. reactions); and applying an elec. field (1-105 Hz, preferably 10-25 Hz) over the plastic surface. At 5-10 Hz mainly oxidn. reactions occur forming hydrophilic channels; at higher frequencies salts penetrate the hydrophilic channels; in absence of an elec. field, the salts are irreversibly trapped inside the ionomer. The method can be continuous by applying an elec. field over the channel-shaped plastic in the medium. The prepd. ionomers can be used as semipermeable **membranes**, **electrolytes** in **polymeric** batteries, and for purifn.

ST ionomer prepn plastic elec field; semipermeable membrane ionomer prepn plastic; electrolyte polymer battery

IT Electric field
(application of, on plastic sheet surface, for prodn. of ionomers)

IT Alcohols, uses
RL: USES (Uses)
(conducting medium, for applying elec. field to plastic sheets, for prodn. of ionomers)

IT Battery electrolytes
(in polymeric, ionomers on plastic surfaces as, prepn. of)

IT Plastics, **extruded**
Plastics, film
Plastics, laminated
RL: PREP (Preparation)
(ionomer prepn. on surface of, elec. field in)

IT Batteries, primary
Batteries, secondary
(polymeric, **ion-conductor** in, **ionomer** on plastic surfaces as, prodn. of)

IT Ionomers
RL: PREP (Preparation)
(prepn. of, on plastic sheet surface, elec. field in)

IT Surfactants
Salts, uses
Soaps
RL: PREP (Preparation)
(reactive components, in prepn. of ionomers on plastic sheet surface, elec. field in)

IT **Membranes**
(semipermeable, ionomers formed on plastic surfaces, by elec. field application)

IT Oxidation, electrochemical
(surface, in application of elec. field on plastic sheet, for prodn. of ionomers)

IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 7664-41-7, Ammonia, uses 7732-18-5, Water, uses
RL: USES (Uses)
(conducting medium, for applying elec. field to plastic sheets, for prodn. of ionomers)

IT 7439-96-5D, Manganese, salts 7440-31-5D, Tin, salts 7440-50-8D, Copper, salts 7446-09-5, Sulfur dioxide, uses 7782-44-7, Oxygen, uses 10028-15-6, Ozone, uses 12624-32-7, Sulfur oxide
RL: USES (Uses)
(reactive component, in prepn. of ionomers on plastic sheet surface, elec. field in)

IT 9002-84-0, PTFE 9002-88-4, Polyethylene 9003-07-0, Polypropylene **9003-53-6**, Polystyrene
RL: USES (Uses)
(sheets, ionomer prepn. on surface of, elec. field in)

IT **9003-53-6**, Polystyrene
RL: USES (Uses)
(sheets, ionomer prepn. on surface of, elec. field in)

RN 9003-53-6 HCAPLUS

CN Benzene, ethenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 100-42-5

CMF C8 H8

$H_2C{=}CH{-}Ph$

L63 ANSWER 63 OF 82 HCAPLUS COPYRIGHT 2002 ACS

AN 1993:418758 HCAPLUS

DN 119:18758

TI **Electrolyte** solution **compositions** and **polymer solid electrolytes**

IN Samura, Tetsuya

PA Sanyo Chemical Ind Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-40
ICS H01B001-06; H01M006-18

CC 76-2 (Electric Phenomena)
Section cross-reference(s): **38**, 52

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04366563	A2	19921218	JP 1991-167603	19910611

AB The electrolyte soln. compns. consist of (1) solvents from butyrolactones, chain ethers, and/or heterocyclic ethers, (2) electrolyte salts, (3) hydroxypropyl(alkyl)cellulose, and optionally (4) org. polyisocyanates. The **solid** electrolytes may be hardened electrolyte soln. compns. (except for electrolytic capacitors). The compns. show high **ion cond.** and prevention of solvent volatilization and are useful for batteries, elec. double layer capacitors, etc.

ST **polymer solid electrolyte compn;** hydroxypropylcellulose **solid** electrolyte; butyrolactone **solid** electrolyte; ether **solid** electrolyte

IT Heterocyclic compounds
RL: USES (Uses)
(ethers, solvents, for polymer **solid** electrolyte compns.)

IT Ethers, uses
RL: USES (Uses)

(heterocyclic, solvents, for polymer **solid** electrolyte compns.)

IT 3385-41-9, Diammonium adipate 9004-64-2, Hydroxypropylcellulose 9004-65-3 14283-07-9 **148251-44-9**
RL: USES (Uses)
(polymer **solid** electrolyte compns. contg.)

IT 110-71-4
RL: USES (Uses)
(polymer solvent, for **solid** electrolyte compns.)

IT 96-48-0, .gamma.-Butyrolactone
RL: USES (Uses)
(solvent, for polymer **solid** electrolyte compns.)

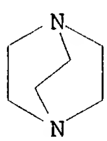
IT **148251-44-9**
RL: USES (Uses)
(polymer **solid** electrolyte compns. contg.)

RN 148251-44-9 HCAPLUS

CN 1,4-Diazabicyclo[2.2.2]octane, polymer with 1,1'-methylenebis[4-isocyanatobenzene] (9CI) (CA INDEX NAME)

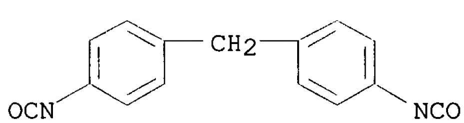
CM 1

CRN 280-57-9
CMF C6 H12 N2



CM 2

CRN 101-68-8
CMF C15 H10 N2 O2



L63 ANSWER 64 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:107701 HCAPLUS
DN 116:107701
TI **Polymer/(liquid crystal) composite** membranes
AU Kajiyama, Tisato
CS Fac. Eng., Kyushu Univ., Fukuoka, 812, Japan
SO Topics in Inclusion Science (1991), 2(Inclusion Aspects Membr. Chem.), 111-55
CODEN: TISCER; ISSN: 0923-6732
DT Journal
LA English
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 37, 75

AB **Polymer/liq. crystal composite**
membranes are **cast** from a soln. of a mixt. of **polymeric**
and **liq.-cryst**. materials. Also, the ultrathin
membranes, .apprx. 20 nm thick, are formed by carefully spreading a single
drop of **casting** soln. on the water surface (water-**cast**
method). The thickness and the aggregation state of the water-
cast membrane can be controlled by the kind of solvent and the
concn. of a soln. Aggregation states of the **composite** membrane
are using DSC, x-ray diffraction, sorption isotherm, sorption-desorption
studies and scanning electron microscopic observation. Liq.-cryst.
materials form a continuous phase in the 3-dimensional spongy network of a
matrix **polymer** when the **liq.-cryst.** fraction
is .apprx.45 wt.%. Therefore, a liq.-cryst. phase can serve as a
low-viscosity diffusing phase for permeants such as gases or metal ions.
The novel **composite** membranes can be applied to O enrichment,
mol. filtration, facilitated or active transport of metal cations and
complete thermocontrol of ion permeation.

ST **liq crystal polymer composite**
membrane

IT Liquid crystals
(**composites** with polycarbonate or PVC, **membranes**
from, prepn. and characterization and uses of)

IT **Membranes**
(from **liq. crystal-polymer**
composites, prepn. and characterization and uses of)

IT Agglomeration
(in **liq. crystal-polymer**
composite membranes)

IT Polycarbonates, uses
RL: SPN (Synthetic preparation); PREP (Preparation)
(liq. crystal **composite membranes**, prepn. and
characterization and uses of)

IT 9002-86-2P, PVC 24936-68-3P, Bisphenol A-carbonic acid **copolymer**
, sru, properties 25037-45-0P, Bisphenol A-carbonic acid
copolymer
RL: SPN (Synthetic preparation); PREP (Preparation)
(**liq. crystal composite membranes**
, prepn. and characterization and uses of)

IT 7782-44-7, Oxygen, properties
RL: USES (Uses)
(**liq. crystal-polymer composite**
membranes for, prepn. and characterization of)

IT 311-89-7, **Perfluorotributylamine** 355-86-2 16069-36-6,
Dicyclohexyl-18-crown-6 96259-20-0 96840-72-1 104909-08-2
104909-09-3 139418-69-2 139418-70-5
RL: USES (Uses)
(**liq. crystal-polymer composites**
contg., **membranes** from, prepn. and characterization and uses
of)

IT 29743-08-6P, N-(4-Ethoxybenzylidene)-4'-butylaniline 40817-08-1P,
4-Cyano-4'-pentylbiphenyl 52364-72-4P, 4-Cyano-4'-heptyloxybiphenyl
RL: SPN (Synthetic preparation); PREP (Preparation)
(**liq.-cryst., polymer composite**
membranes, prepn. and characterization and uses of)

L63 ANSWER 65 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 910865792 JICST-EPlus
TI Electrochemical behavior of conducting polymer/**polymer**
solid electrolyte composite.
AU OSAWA TOSHIYUKI; KABATA TOSHIYUKI; FUJII TOSHISHIGE; KIMURA OKITOSHI

YOSHINO KATSUMI
CS Ricoh Co., Ltd., Res. and Development Center
Osaka Univ., Faculty of Engineering
SO Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku (IEIC Technical Report (Institute of Electronics, Information and Communication Enginners)), (1991) vol. 91, no. 209(OME91 23-34), pp. 19-24. Journal Code: S0532B (Fig. 11, Ref. 12)
CY Japan
DT Journal; Article
LA Japanese
STA New
CC CG02024U; CB07040U (544.23-16:535/538; 544.652)
CT polymer; polyaniline; polyelectrolyte; **solid** electrolyte; conducting polymer; cyclic voltammetry; electrolytic polymerization; polymer membrane; block copolymer; polyurethane coatings; **ionic conduction**; electrical conductivity; laminated material; impedance; lithium cell; doping; electrochemical behavior; polyalkylene oxide; sulfur heterocyclic compound; cyclic ether
BT functional polymer; macromolecule; electrolyte; matter; voltammetry; instrumental analysis; analysis(separation); analysis; polymerization; chemical reaction; electrochemical reaction; membrane and film; copolymer; synthetic resin coatings; coating material(paint); electric conduction; electrical property; ratio; transport coefficient; coefficient; material; primary cell; chemical cell; battery; behavior; thermoplastic; plastic; polyether; heterocyclic compound; ether; oxygen heterocyclic compound

L63 ANSWER 66 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 1990-280154 [37] WPIX
DNN N1990-216146 DNC C1990-121069
TI Solid polymer electrolyte for batteries etc. - consists of per fluoro sulphonate polymer and/or its salt and polyethylene glycol and/or its ether.
DC A85 L03 S03 U14 X16
PA (MATW) MATSUSHITA ELECTRIC WORKS LTD
CYC 1
PI JP 02198642 A 19900807 (199037)*
ADT JP 02198642 A JP 1989-18608 19890126
PRAI JP 1989-18608 19890126
IC B01J039-16; B01J047-12; H01M006-18
AB JP 02198642 A UPAB: 19930928
Solid **polymer electrolyte composite** consists of perfluorosulphonate polymer and/or its salt and polyethylene glycol and/or its ether.

USE/ADVANTAGE - Used as an **ion conductor** for electrochemical devices like batteries, electrochromic displays, fuel cells, or ion or gas sensors. The **composite** has a lower resistance for **ionic conduction**. The resistance is less dependent on humidity.

In an example, 'Nafion'(RTN, perfluorosulphonate polymer, Du Pont Corp.) was ion-exchanged with Li ions; the polymer was dissolved in 5 wt.% in a 1:1 mixed soln. of iso- and n-propanol; 10 pts. wt. of tetraethylene-glycoldimethylether and 4 pts. wt. of lithium perfluoromethanesulphonate (w.r.t. 100 pts. wt. of the polymer) were mixed with the soln.; the mixt. was **cast** on a plate with Au electrodes and dried.
FS CPI EPI
FA AB; GI
MC CPI: A04-E10; A05-H03; A09-A03; A10-E01; A12-E01; A12-M02; L03-A02C; L03-E01C; L03-E04; L03-G05C
EPI: S03-E03C; U14-K09; X16-C; X16-J

L63 ANSWER 67 OF 82 WPIX (C) 2002 THOMSON DERWENT
AN 1989-159231 [22] WPIX
CR 1991-252056 [34]; 1994-219773 [27]
DNN N1989-121442 DNC C1989-070664
TI **Compsns.** for **polymeric electrolyte** prodn. - comprising radiation polymerisable cpd., **ionically conducting** liq. and alkali metal salt.
DC A85 L03 X16
IN LEE, M T; SCHWAB, G; SHACKLE, D; LEE, M; SHACKLE, D R
PA (MHBJ-N) MHB JOINT VENTURE; (VALE-N) VALENCE TECHNOLOGY INC
CYC 14
PI

EP 318161	A	19890531	(198922)*	EN	15p	
R: BE DE FR GB IT NL SE						
US 4830939	A	19890516	(198923)		9p	
DK 8806020	A	19890501	(198927)			
JP 02000602	A	19900105	(199007)			
CN 1033126	A	19890524	(199018)			
US 5238758	A	19930824	(199335)		8p	H01M005-54
EP 318161	B1	19941214	(199503)	EN	20p	H01M006-18
R: BE DE FR GB IT NL SE						
DE 3852476	G	19950126	(199509)			H01M006-18
US 4830939	B1	19961008	(199646)		2p	H01M006-18
CA 1339619	C	19980106	(199813)			H01M006-18
SG 49684	A1	19980615	(199836)			H01M006-18
JP 2817923	B2	19981030	(199848)		13p	H01M006-18
KR 131460	B1	19980424	(200001)			H01M006-18
DK 2001001740	A	20011121	(200211)			H01M006-18
DK 2001001741	A	20011121	(200211)			C08F299-02

ADT EP 318161 A EP 1988-310179 19881028; US 4830939 A US 1988-173385 19880325; JP 02000602 A JP 1988-270628 19881026; US 5238758 A CIP of US 1987-115492 19871030, Cont of US 1988-173385 19880325, Cont of US 1989-326574 19890321, Cont of US 1990-549658 19900709, US 1991-776722 19911015; EP 318161 B1 EP 1988-310179 19881028; DE 3852476 G DE 1988-3852476 19881028, EP 1988-310179 19881028; US 4830939 B1 Cont of US 1987-115492 19871030, US 1988-173385 19880325; CA 1339619 C CA 1988-581609 19881028; SG 49684 A1 SG 1996-4066 19881028; JP 2817923 B2 JP 1988-270628 19881026; KR 131460 B1 KR 1988-14131 19881029; DK 2001001740 A DK 2001-1740 20011121; DK 2001001741 A DK 2001-1741 20011121
FDT US 5238758 A Cont of US 4830939; DE 3852476 G Based on EP 318161; JP 2817923 B2 Previous Publ. JP 02000602
PRAI US 1987-115492 19871030; US 1988-173385 19880325
REP 2.Jnl.Ref; DE 2737994; DE 3033562; EP 174894; EP 260847; EP 298802; JP 63094563; WO 8706395; 02Jnl.Ref; DE 3236027; WO 8200147
IC H01M006-18
ICM C08F299-02; H01M005-54; H01M006-18
ICS C08F002-44; C08F002-46; C08F283-10; C08G059-22; H01M006-22
AB EP 318161 A UPAB: 20020215
Compsns. (I) for prodn. of polymeric electrolytes comprise a radiation-polymerisable liq. monomer or prepolymer (II), a radiation-inert **ionically conducting** liq. (III) and an ionisable alkali metal salt (IV) Also claimed is the prodn. of polymeric electrolytes by exposing (I) to actinic radiation, and the prodn. of anode and cathode half elements and solid-state electrochemical cells.

Pref. (II) is a polyethylenically unsatd. cpd. contg. at least one heteroatom, esp. a polyethylene glycol di(meth)acrylate, or a polyethylene glycol diglycidyl ether. (III) is a polar aprotic solvent esp. a polyethylene glycol dimethy ether. (IV) is of formula MX, where M=Li, Na, K or NH4 and X=I, Br, SCN, ClO4, CF3SO3, BF4, PF6, CF3COO or AsF6. The actinic radiation is UV or electron beam radiation. (I) contain at least

45 (pref.) at least 70) wt.% (III).
Anode half elements are produced by coating an anodic metal foil with (I) and irradiating. Cathode half elements are produced by coating a metal foil with a compsn. (Ia) comprising (II), (III), an active cathode material (V) and an electronic conductor, and irradiating (V) is pref. an intercalation cpd., esp. a V oxide.
Dwg.0/0
Dwg.0/0
FS CPI EPI
FA AB
MC CPI: A10-B06; A11-B05C; A11-C02B; A11-C02C; A12-E06A; L03-E01C; L03-E02
EPI: X16-A02; X16-J

L63 ANSWER 68 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1989-146560 JAPIO
TI BIOSTIMULATING ELECTRODE USING **SOLID** ELECTROLYTE MEMBRANE
IN YAMAUCHI SHIGERU; IKARIYAMA YOSHITO
PA KOKURITSU SHINTAI SHIYOUGAISHIYA RIHABIRITEESHIYON CENTER SOUCHIYOU
PI JP 01146560 A 19890608 Heisei
AI JP 1987-303361 (JP62303361 Showa) 19871202
PRAI JP 1987-303361 19871202
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989
IC ICM A61N001-04
AB PURPOSE: To obtain an electrode which gives electric stimuli to an organism without causing side effects or oxidation-reduction reactions of biosubstance, by coating chemical substances relevant to oxidation-reduction reactions with an **ion-conductive** diaphragm.
CONSTITUTION: An electrode has a metal-conductive **substrate** 1 for supplying electricity from an outer power source, an electroactive substance 2 laid on the **substrate** 1 and a **solid** electrolyte membrane 3 covering both 1 and 2. The electroactive substance consists of both oxidized and reduced forms, and is desirable to show reversible electrode-reactions with ions penetrating through the **solid** electrolyte membrane 3. The **solid** electrolyte membrane used may be an ion-exchange **membrane**, a **polymeric electrolyte membrane** made of, e.g., a polyethylene oxide-alkali halid compound or a ceramic electrolyte membrane made of, e.g., Na<SB>3</SB>Zr<SB>2</SB>PSi<SB>2</SB>O<SB>12</SB>. The biostimulating electrode gives electric stimuli to an organism without causing oxidation-reduction reactions of biosubstance since the tissues are separated from the place of electrode- reactions.

L63 ANSWER 69 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 890201847 JICST-EPlus
TI Photo-induced **ionic conductivity** switching in **polymer**/photochromic **liquid crystal** **composite** films containing lithium/crown ether complex.
AU KIMURA K; SUZUKI T; YOKOYAMA M
CS Osaka Univ., Suita, JPN
SO Chem Lett, (1989) no. 2, pp. 227-230. Journal Code: S0742A (Fig. 2, Ref. 6)
CODEN: CMLTAG; ISSN: 0366-7022
CY Japan
DT Journal; Short Communication
LA English
STA New
AB Thin **composite** films consisting of poly(vinyl chloride), azobenzene liquid crystal, lithium ion/12-crown-4 complex exhibited

reversible photo-induced switching of **ionic conductivity** based on the photochromic phase transition of the azobenzene derivative. The **ionic conductivities** increased by more than two orders of magnitude by UV light and then reverted to the initial state by visible light at ambient temperature.(author abst.)

CC CG02024U; BK03010L; BL06021L (544.23-16:535/538; 544.25; 539.219.3)

CT **composite** film; liquid crystal; polyvinyl chloride; lithium complex; crown ether; perchlorate; phenol ether; photochromism; phase transition; **ionic conduction**; ultraviolet irradiation; photoirradiation; switching; visible light; **solid** electrolyte; thin film; polymer membrane; aromatic compound; azo compound

BT membrane and film; mesophase; phase(thermodynamics); chlorine-containing polymer; halogen-containing polymer; polymer; thermoplastic; plastic; alkali metal complex; alkali metal compound; metal complex; complex(compound); coordination compound; compound(chemical); lithium compound; cyclic ether; ether; oxygen heterocyclic compound; heterocyclic compound; macrocyclic compound; chlorine oxoate; chlorine compound; halogen compound; halogen oxoate; oxoate; oxygen compound; oxygen group element compound; optical property; electric conduction; electrical property; electromagnetic irradiation; irradiation; radiation exposure(irradiation); light; electromagnetic wave; wave motion; electrolyte; matter; functional polymer; macromolecule; vic-polynitrogen compound

L63 ANSWER 70 OF 82 HCAPLUS COPYRIGHT 2002 ACS

AN 1989:61081 HCAPLUS

DN 110:61081

TI Manufacture of batteries with **polymeric electrolyte membrane**-cathode **composites**

IN Ashitaka, Hidetomo; Takahashi, Toru

PA Ube Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-40
ICS H01M004-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **38**

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 63181273	A2	19880726	JP 1987-12272	19870123

AB A monomer is impregnated in an **ion-conductive** polymer electrolyte and electropolymd. by attaching a pair of electrodes to the opposite sides of the electrolyte to obtain a **composite** having an electron-conducting polymer-cathode film on 1 side of an **ion-conductive** polymer-electrolyte film for use in batteries. Thus, a mixt. contg. poly(ethylene glycol) Me ether acrylate (AM-90G) 0.75, poly(ethylene glycol) dimethacrylate (9G) 0.25, poly(ethylene glycol) (PEG 200) 0.75, LiClO4 0.08, and benzoyl peroxide 0.01 g were mixed, made into a oln., **cast** to form a film, cured by heating at 70.degree. for 14 h in N to obtain a 300-.mu.m **ion-conductive** polymer-electrolyte film, and impregnated with 20 wt.% pyrrole. A pair of ITO-glass electrodes were attached to the pyrrole-impregnated film and a 50-.mu.A/cm2 current was passed through the electrodes for 30 min to polymerize pyrrole to obtain an electrolyte-polypyrrole cathode **composite**. When cycled at 20 .mu.A/cm2 for 20-min charging and discharging to 1-V cutoff, a battery prepd. from a Li anode and this **composite** retained 100% coulombic efficiency for >300 cycles.

ST battery polypyrrole cathode electrolyte **composite**; PEG crosslinked electrolyte cathode **composite**; lithium perchlorate electrolyte cathode **composite**
IT Cathodes
(battery, polypyrrole, **composites** from lithium perchlorate-crosslinked PEG deriv. electrolyte films and)
IT 30604-81-0, Polypyrrole
RL: USES (Uses)
(cathodes, **composites** from lithium perchlorate-crosslinked PEG deriv. electrolyte films and, for batteries)
IT 7791-03-9, Lithium perchlorate
RL: USES (Uses)
(electrolytes from crosslinked PEG derivs. and, **composites** of polypyrrole cathodes and, for batteries)
IT 118588-62-8
RL: USES (Uses)
(electrolytes from lithium perchlorate and, **composites** of polypyrrole cathodes and, for batteries)

L63 ANSWER 71 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 1988-254678 JAPIO
TI **SOLID** ELECTROLYTE TYPE FUEL CELL AND ITS MANUFACTURE
IN ARAI HIROMICHI
PA ARAI HIROMICHI
PI JP 63254678 A 19881021 Showa
AI JP 1987-89346 (JP62089346 Showa) 19870411
PRAI JP 1987-89346 19870411
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1988
IC ICM H01M008-12
AB PURPOSE: To prevent the slaking and reducing of an oxygen **ion conductive** film by polymerizing the oxygen **ion conductive** film made of a cerium oxide **solid** solution and a thin film layer made of a zirconium oxide **solid** solution to form a **composite solid** electrolyte film.
CONSTITUTION: An oxygen **ion conductive** film with the thickness of 5∼750μm is formed with a **solid** solution of cerium oxide having the high **ion conductivity** of the oxygen **ion** and the bivalent or tervalent metal oxide of the alkaline earth metal except calcium or the rare earth element. Next, a thin film with the thickness of 0.1∼10μm is formed with a **solid** solution of zirconium oxide and the bivalent or tervalent metal oxide of the alkaline earth metal except calcium or the rare earth element on this film and **polymerized** into a **composite solid electrolyte** film. The calcium oxide is thus excluded to prevent the slaking of the oxygen **ion conductive** film, the thickness of the film is set to the specific range to prevent the reducing, the power generating characteristic is thereby improved.

L63 ANSWER 72 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1988:474433 HCAPLUS
DN 109:74433
TI Novel **polymer/liquid crystal composite** membrane with unique permselective characteristics
AU Kajiyama, Tisato; Kikuchi, Hirotsugu; Shinkai, Seiji
CS Fac. Eng., Kyushu Univ., Fukuoka, 812, Japan
SO Journal of Membrane Science (1988), 36, 243-55
CODEN: JMESDO; ISSN: 0376-7388
DT Journal

LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): **38**, 75
AB A series of built-up thin films composed of **polymer** and **liq. crystal** (LC) (60% wt. fraction in the **composite**) was prepd. by spreading a single drop of mixt. soln. on a water surface. The thickness and the aggregation state of the water-**cast** membrane can be controlled by the kind of solvent and the concn. of the mixt. soln. LC material forms a continuous phase in the 3-dimensional spongy network of the polymer matrix. Therefore, the LC phase can play the role of a low viscous diffusing phase for permeants such as gases or metal ions. The novel polymer/LC **composite** membranes can be applied to O enrichment, mol. filtration, active transport of metal cations, and complete thermocontrol of ion permeation.
ST **liq crystal polymer composite** membrane; permselectivity **liq crystal polymer composite**
IT Liquid crystals
((ethoxybenzyldiene)butylamiline and cyanopentylbiphenyl, **composites** with polymers and/or crown ethers and/or fluorocarbon and phosphate, as permselective **membranes**)
IT Polycarbonates, uses and miscellaneous
RL: USES (Uses)
(**composites** with liq. crystal and crown ether compds., **membranes**, permselective characteristics of)
IT Transport process and property
(of potassium toluenesulfonate in acidic and basic phases, through **polymer-liq. crystal**-crown ether **composite** permselective **membranes**, mechanism of)
IT Ultraviolet radiation, chemical and physical effects
(on transport of potassium toluenesulfonate basic and acidic phases through **polymer-liq. crystal**-crown ether **composite** permselective **membranes**)
IT Permeability and Permeation
(permselective, of liqs. and gases, in **polymer-liq. crystal composites** contg. crown ether and/or fluorocarbon monomers and phosphates)
IT Isomerization
(cis-trans, photochem., of azobenzene-bridged crown ether, in **composites** with PVC and liq. crystal compd., transport mechanism of potassium toluenesulfonate acidic and basic phases in relation to)
IT Crown compounds
RL: USES (Uses)
(ethers, **composites** with PVC and polycarbonates and liq. crystal compds., **membranes**, permselective characteristics of)
IT **Membranes**
(permselective, PVC- and polycarbonate-liq. crystal **composites** contg. crown ethers and/or fluorocarbon monomers, prepn. and characterization of)
IT 82353-43-3 96259-20-0 111278-20-7
RL: USES (Uses)
(**composites** with PVC or polycarbonate and liq. crystal compds., **membranes**, permselective characteristics of)
IT 24936-68-3, properties 25037-45-0
RL: PRP (Properties)
(**composites** with liq. crystal and crown ether compds., **membranes**, permselective characteristics of)
IT 9002-86-2P, PVC
RL: SPN (Synthetic preparation); PREP (Preparation)

(**composites** with liq. crystal and/or crown ether compds., **membranes**, prepn. and permselective characteristics of)

IT 311-89-7, **Perfluorotributylamine** 355-86-2
RL: USES (Uses)
(**composites** with liq. crystals and PVC, **membranes**, permselective characteristics of)

IT 7782-44-7, Oxygen, properties
RL: PRP (Properties)
(enrichment, **polymer-liq. crystal** -fluorocarbon monomer ternary **composite membrane** for)

IT 40817-08-1
RL: USES (Uses)
(liq. crystal, PVC **composites, membranes**, permselective characteristics of)

IT 29743-08-6, N-(4-Ethoxybenzylidene)-4-butylaniline
RL: USES (Uses)
(liq. crystal, **composites** with polycarbonate or PVC and/or crown ethers and fluorocarbon monomers, **membranes**, permselective characteristics of)

IT 7727-37-9, Nitrogen, properties
RL: PRP (Properties)
(oxygen mixts., permselectivity to, of **polymer-liq. crystal**-phosphate **composite membranes**)

IT 75-28-5, iso-Butane 106-97-8, n-Butane, properties
RL: USES (Uses)
(permeability to, of PVC-liq. crystal **composite membranes**, effect of applied voltage and photochem. radiation on)

IT 16106-44-8, Potassium p-toluenesulfonate
RL: USES (Uses)
(transport of acidic and basic phases of, through **polymer-liq. crystal**-crown ether **composite** permselective **membranes**, mechanism of)

L63 ANSWER 73 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 870447277 JICST-EPlus
TI Polypyrrole/**polymer electrolyte** bilayer **composites** prepared by electrochemical polymerization of pyrrole using **ion-conducting** polymers as a **solid** electrolyte.
AU WATANABE M; TADANO K; SANUI K; OGATA N
CS Sophia Univ., Tokyo, JPN
SO Chem Lett, (1987) no. 6, pp. 1239-1242. Journal Code: S0742A (Fig. 2, Ref. 8)
CODEN: CMLTAG; ISSN: 0366-7022
CY Japan
DT Journal; Short Communication
LA English
STA New
AB The electrochemical polymerization of pyrrole using **ion-conducting** polymers as a **solid electrolyte** produces polypyrrole/**polymer electrolyte** bilayer **composites** in situ. The bilayer **composites** show electrochemical activity, corresponding to doping and undoping reactions, in **solid** state.(author abst.)
CC CG02024U (544.23-16:535/538)
CT polypyrrole; polyelectrolyte; bilayer; complex(substance); conducting polymer; **solid** electrolyte; polyethylene oxide; aliphatic alcohol; electrical conductivity; **ionic conduction**;

electrolytic polymerization; electronic spectrum; doping; lithium chloride; lithium compound; boron complex; organoboron compound; lithium bromide; thiocyanate(salt); lithium perchlorate; fluoroborate; lithium iodide; potassium compound; sodium compound; ultraviolet spectrum; visible spectrum; aromatic compound; inorganic acid ester; organocyano compound; nitrogen heterocyclic compound

BT polyheteroarylyene; polyarylene; polymer; functional polymer; macromolecule; electrolyte; matter; multilayer(molecule); multilayer; layer; thin film; membrane and film; polyalkylene oxide; thermoplastic; plastic; polyether; alcohol; hydroxy compound; ratio; transport coefficient; coefficient; electric conduction; electrical property; polymerization; chemical reaction; electrochemical reaction; spectrum; alkali metal halide; alkali metal compound; halide; halogen compound; chloride; chlorine compound; 3B group element complex; complex(compound); coordination compound; compound(chemical); 3B group element compound; boron compound; organometalloidal compound; bromide; bromine compound; cyanogen compound; carbon compound; carbon group element compound; nitrogen compound; nitrogen group element compound; thio acid; sulfide(chalcogenide); sulfur compound; oxygen group element compound; chalcogenide; perchlorate; chlorine oxoate; halogen oxoate; oxoate; oxygen compound; fluoro acid; halogeno acid; fluoride; fluorine compound; boron oxyacid derivative; iodide; iodine compound; ester; heterocyclic compound

L63 ANSWER 74 OF 82 JICST-EPlus COPYRIGHT 2002 JST
AN 870368342 JICST-EPlus
TI Elastomer as an electronics material.
AU KOHJIYA SHINZO
CS Kyoto Univ. of Industrial Arts and Textile Fibers
SO Porima Daijesuto (Polymer Digest), (1987) vol. 39, no. 7, pp. 22-41.
Journal Code: F0500A (Fig. 16, Tbl. 7, Ref. 43)
CODEN: PODADB; ISSN: 0386-3700
CY Japan
DT Journal; Commentary
LA Japanese
STA New
CC NA04010A; YH06080T (621.315+621.318; 678.06+)
CT electric material; rubber elasticity; amorphous state; glass transition point; reinforced rubber; **composite** material; conducting polymer; **ionic conduction**; **liquid crystal polymer**; optical fiber; optoelectronics; display device; polyelectrolyte; polysiloxane
BT material; elasticity(mechanical property); mechanical property; property; glassy state; **solid**(matter); transition temperature; temperature; thermodynamic property; functional polymer; macromolecule; electric conduction; electrical property; liquid crystal; mesophase; phase(thermodynamics); optical element; optical system; fiber; electronics; technology; equipment; electrolyte; matter; inorganic polymer; polymer

L63 ANSWER 75 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1986:444227 HCAPLUS
DN 105:44227
TI Ionic fluorinated **polymer** for **electrolysis membranes**
IN Blaise, Jean; Jaccaud, Michel; Laviron, Charles; Mathais, Henri; Ravier, Dominique; Leroux, Francis
PA Atochem S. A., Fr.
SO PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DT Patent

LA French
IC ICM C08F008-00
CC 38-2 (**Plastics Fabrication** and Uses)
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 8600624	A1	19860130	WO 1985-FR185	19850703
	W: AU, JP, US				
	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
	FR 2567527	A1	19860117	FR 1984-11145	19840713
	FR 2567527	B1	19861128		
	FR 2589865	A2	19870515	FR 1985-9396	19850620
	FR 2589865	B2	19871224		
	AU 8545432	A1	19860210	AU 1985-45432	19850703
	AU 584625	B2	19890601		
	JP 62500243	T2	19870129	JP 1985-502945	19850703
	JP 06057723	B4	19940803		
	AT 40558	E	19890215	AT 1985-903302	19850703
PRAI	FR 1984-11145		19840713		
	FR 1985-9396		19850620		
	EP 1985-903302		19850703		
	WO 1985-FR185		19850703		

AB Ionic polymers have a **perfluorocarbon** backbone with side chains of (OCF2CFR)mO(CF2)nSO3M or (OCF2CFR)pO(CF2)qCO2M and crosslinks of [(OCF2CFR)pO(CF2)q]wX [w = 2-10; m,p = 0-3; n,q = 1-6; M = H, monovalent cation; R = F, C1-10 **perfluoroalkyl**; X = direct link, (CFR1O)r(CF2CFR1O)sZ(OCFR1CF2)t(OCFR1)u; R1 = F, C1-10 **perfluoroalkyl**, sulfoperfluoroalkyl, carboxyperfluoroalkyl; Z = C1-12 linear or acyclic **perfluorocarbon**; s,t = 0-3; r,u = 0 or 1] are prepd. from polymers having carboxylic groups which are transformed into reactive entities which are eliminated. The membranes from these polymers are useful for the electrolysis of alk. halides. Thus, in the presence of 1,1,2-trifluoro-1,2,2-trichloroethane and bis(**perfluoropropionyl**) peroxide, C2F4 9.5, CF2:CFOCF2CF(CF3)OCF2CF2SO2F 0.2, and CF2:CFO(CF2)4CO2Me 0.8 mol were terpolymd. and **cast** in a film 250 .mu. thick. The film was hydrolyzed in 120 g/L NaOH in 40% aq. MeOH at 90.degree. for 16 h. The membrane was washed in H2O, dried in vacuo at 50.degree. for 16 h, and submerged in SOCl2 (80.degree.) for 10 h. It was placed in a reactor with a surface contacting a soln. of 0.42 g Na2O2 and 20 g H2O in methanol at -15.degree. for 1 h, washed with cold water, stored under N at 40.degree. for 2 h, and immersed in methanolic HCl. The membrane was hydrolyzed in 120 g/L NaOH in 40% aq. MeOH for 8 h at 90.degree. to give a product that showed good activity in the electrolysis of aq. NaCl and no loss of electrolytic activity or degrdn. after 8 h in 45% aq. soda at 90.degree..

ST ionic **perfluoropolymer** electrolysis membrane; tetrafluoroethylene copolymer ionic electrolysis membrane

IT Cation exchangers
(**membranes**, ionic **perfluoropolymer**-based, for electrolysis of alkali metal halides)

IT 57578-67-3D, hydrolyzed, chlorinated, esterified
RL: USES (Uses)
(**membranes**, for brine electrolysis)

IT 356-15-0 377-38-8 103136-02-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with hydroxy group-contg. **perfluoropolymers**)

L63 ANSWER 76 OF 82 HCAPLUS
AN 1986:20357 HCAPLUS
DN 104:20357

TI Oxygen enrichment effect of **polymer/liquid crystal composite** membrane containing fluorocarbon
AU Ohmori, Yoh; Kajiyama, Tisato
CS Fac. Eng., Kyushu Univ., Fukuoka, 812, Japan
SO Nippon Kagaku Kaishi (1985), (10), 1897-903
CODEN: NKAKB8; ISSN: 0369-4577
DT Journal
LA Japanese
CC 38-3 (**Plastics Fabrication** and Uses)
AB O enrichment by **polymer-liq. crystal composite** membranes contg. fluorocarbon (I) was investigated. I, e.g., **perfluorotributylamine** (II) [311-89-7], was contained in the micelles formed by a surface-active agent. The ternary **composite** membrane was prepd. by **casting** a tetrahydropyran soln. of a mixt. of PVC [9002-86-2], N-(4-ethoxybenzylidene)-4'-butylaniline (III) [29743-08-6] and I. On the basis of differential scanning calorimetric measurements, extn. tests, and scanning electron microscopic observations, the aggregated state of the ternary **composite** membrane resembled that of the I-free **composite** membrane; i.e., III mols. **interpenetrated** through the three dimensional spongy networks of the PVC matrix forming a continuous phase. The O permeability coeff., PO for the ternary **composite** membrane is greater than that of the I-free membrane. In the case of the ternary **composite** membrane contg. II, a remarkable O enrichment effect was obsd. The order of PO was 10-9.apprx.10-8 cm3 cm-1-s-1-cmHg-1 and the magnitude of the permeability coeff. ratio (PO/PN) was 3.5.apprx.4.0 in the nematic or isotropic state of III. I plays a role of enhancing soly. of O in the **composite** membrane surface. The ternary **composite** membrane exhibited a unique behavior which revealed an increase in PO/PN as PO increased above the glass transition temp. of the matrix polymer. This effect is caused by a desirable combination of the thermal mol. motions from both the matrix **polymer** and the **liq. cryst.** material.
The unique relation between PO/PN and PO of the **composite** membrane leads to practical application as O enrichment membranes in the medical and engineering fields.
ST PVC oxygen enrichment membrane; liq crystal oxygen enrichment membrane; fluorocarbon oxygen enrichment membrane
IT Liquid crystals
(PVC-fluorocarbon blends, for oxygen enrichment **membranes**)
IT **Membranes**
(fluorocarbon-liq. crystal-PVC, for oxygen enrichment)
IT 29743-08-6
RL: USES (Uses)
(fluorocarbon-PVC blends, for oxygen enrichment **membranes**)
IT 9002-86-2
RL: USES (Uses)
(fluorocarbon-liq. crystal blends, for oxygen enrichment **membranes**)
IT 311-89-7 355-86-2 3108-24-5 99634-52-3
RL: USES (Uses)
(liq. crystal-PVC blends, for oxygen enrichment **membranes**)
IT 9003-11-6 82030-85-1
RL: USES (Uses)
(surfactants, in fluorocarbon-liq. crystal-PVC blend **membranes**, for oxygen enrichment)

L63 ANSWER 77 OF 82 RAPRA COPYRIGHT 2002 RAPRA
AN R:278473 RAPRA FS Rapra Abstracts
TI NEW **COMPOSITE POLYMERIC ELECTROLYTES**.

AU Guyot A; Hamaide T; Le Mehaute A; Crepy G; Marcellin G
CS CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
SO Polymer Preprints
26,No.1,April 1985,p.112-3
PY 1985
DT Conference Article
LA English
AB A macromer of PEO was grafted onto an NBR to crosslink the system, make it more compatible with the PEO-lithium salt **solid** polyelectrolyte, as well as to plasticise initially, and to inhibit or modify crystallisation. Membranes of the **composite** material were **cast** from acetonitrile solution of the components, pressed between electrodes and inserted into a battery container. **Ionic conductivity** was measured. The formation of semi-crystalline phase II, which was probably responsible for loss in conductivity on ageing, was inhibited. 12 refs.
CC 43C521; 6125; 6E4.12; 6M
SC *OD; QF; QM
CT AGEING; DEGRADATION; BATTERY; BLEND; COMPATIBILITY; **COMPOSITE**; CROSSLINK; CRYSTALLIS; CRYSTALLISATION; ELECTRICAL APPLICATION; ELECTRICAL PROPERTIES; GRAFT COPOLYMER; GRAFT POLYMERISATION; GRAFT COPOLYMERISATION; **IONIC CONDUCTIVITY**; MACROMER; MEMBRANE; NBR; BUTADIENE-ACRYLONITRILE COPOLYMER; PEO; ETHYLENE OXIDE POLYMER; PLASTICISE; POLYELECTROLYTE; RUBBER-MODIFIED; SEMI-CRYSTALLINE; **SOLID STATE**; SOLUTION; **SOLVENT CAST**; AGING; CRYSTALLIZATION; GRAFT COPOLYMERIZATION; GRAFT POLYMERIZATION; PLASTICIZE
NPT ACETONITRILE; LITHIUM SALT
SHR BLENDS, PEO; ELECTRICAL APPLICATIONS, blends,PEO; ELECTRIC BATTERIES; POLYELECTROLYTES
GT FRANCE

L63 ANSWER 78 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1985:186275 HCAPLUS
DN 102:186275
TI Organic polymer membrane
PA Mitsui Toatsu Chemicals, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM B01D013-00
ICS B01D053-22; C08K005-16; C08L027-00
ICA C08J005-18
CC 38-3 (**Plastics Fabrication** and Uses)
Section cross-reference(s): 48
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 59213407	A2	19841203	JP 1983-85561	19830516

AB Compns. of halovinyl **polymers** and nematic **liq. crystals** can be mixed with permselectivity-enhancing agents and formed into membranes having a good balance of permeation rates, permselectivity, and mech. strength. Thus, PVC [9002-86-2] 2.4, N-(4-ethoxybenzylidene)-4'-n-butylaniline (I) [29743-08-6] (liq. crystal) 3.6, **perfluorotributylamine** [311-89-7] (for O permselectivity) 0.4, and triblock polyoxyethylene-polyoxypropylene surfactant 0.4 g were dissolved in THF, **cast** on a Petri dish, and washed with water to give a 150-.mu. **composite** membrane having O permeability 10.2 .times. 10-10 cm3/cm-s-cm Hg, O/N sepn. factor 5.10 at 307 K and tensile elongation at break 413%, vs. 205% using 6.0 g PVC and no I.

ST **perfluorotributylamine** PVC membrane permselective oxygen; permselective membrane nematic liq crystal; oxygen permselective membrane liq crystal; halovinyl polymer membrane controlled permselectivity; vinyl polymer membrane controlled permselectivity
IT **Liquid crystals**
(nematic, halovinyl **polymer membranes** contg., with permselectivity-enhancing agents)
IT **Membranes**
(permselective, halovinyl polymer blends with nematic liq. crystals and selectivity-enhancing agents)
IT 29743-08-6
RL: USES (Uses)
(halovinyl polymer **membranes** contg., with permselectivity-enhancing agents)
IT 9002-86-2
RL: USES (Uses)
(**membranes**, contg. nematic liq. crystals and perselectivity-enhancing agent)
IT 311-89-7
RL: USES (Uses)
(oxygen permselectivity-enhancing agents, for halvinyl polymer **membranes** contg. nematic liq. crystals)

L63 ANSWER 79 OF 82 HCAPLUS COPYRIGHT 2002 ACS
AN 1979:94457 HCAPLUS
DN 90:94457
TI Cation-exchange membrane for brine electrolysis
IN Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Hane, Toshioki; Hamada, Masato
PA Asahi Chemical Industry Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC C08J005-22
CC 72-10 (Electrochemistry)
Section cross-reference(s): **37**, 66
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 53125986	A2	19781102	JP 1977-40414	19770411
	JP 62040372	B4	19870827		

AB A certain exchange membrane useful in a brine electrolysis cell is obtained by converting the OCF2CF2X (X = Cl, Br, I) present in the side chain of a fluorocarbon polymer film to OCF2CO2M (M = metal or NH4 ion). Optionally, the OCF2CF2X group of the fluorocarbon polymer is bonded to a side chain of the formula O(CF2CRfFO)nCF2CF2X (Rf = F, CF3; n = 0-3) and the -OCF2CF2X group is present only in the surface layer of 1 side of the membrane and the OCF2CF2SO3M group is present in the remaining layer. Thus, a copolymer of C2F4 and **perfluoro**(3,6-dioxo-4-methyl-7-octenesulfonyl fluoride) was obtained in CCl2FCClF2 at 45.degree. and 5 atm. The copolymer was **cast** into a film , sapond. in 2.5N NaOH, treated with 1N HCl then converted to the sulfonyl chloride by refluxing with 1:1 PCl5-POCl3. Two of these sheets were stretched onto an acrylic resin fram and immersed in a satd. aq. I soln. to treat only 1 side of the sheet to form OCF2CF2I groups. The treated surface was then exposed to UV for 16 h to convert the OCF2CF2I groups to carboxylic acid groups. The sheet was then hydrolyzed in 2.5N NaOH. The membrane showed a specific elec. cond. of 9.8 .times. 10-3 mho/cm in 0.1N NaOH. The membrane showed a current efficiency of 95%.

ST **perfluorocarbon polymer membrane** brine
electrolysis; PTFE perlfuoromethyloctene sulfonyl membrane; sodium
hydroxide chlorine electroprodn brine
IT Brines
(electrolysis of, cation-exchange **membrane** cell for)
IT Electrolytic cells
(diaphragm, cation-exchange, for brines)
IT 26654-97-7D, carboxy derivs., salts
RL: PRP (Properties)
(cation-exchange **membrane**, for brine electrolytic cells)
IT 1310-73-2P, preparation 7782-50-5P, preparation
RL: PREP (Preparation)
(manuf. of, by brine electrolysis, cation-exchange **membrane**
cell for)

L63 ANSWER 80 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 2002-198067 JAPIO
TI HIGH-TEMPERATURE OPERATING **SOLID POLYMER**
COMPOSITE ELECTROLYTE MEMBRANE,
MEMBRANE/ELECTRODE BONDED BODY AND FUEL CELL
IN KAMO YUICHI; YAMAGA MASASHI; KUDO TETSUICHI; MIYAYAMA MASARU; HONMA ITARU;
TODA TAKAKO
PA HITACHI LTD
UNIV TOKYO
NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL & TECHNOLOGY
PI JP 2002198067 A 20020712 Heisei
AI JP 2000-393073 (JP2000393073 Heisei) 20001225
PRAI JP 2000-393073 20001225
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
IC ICM H01M008-02
ICS C08G065-08; C08K003-22; C08L101-00; H01B001-06; H01B001-12;
H01M008-10
AB PROBLEM TO BE SOLVED: To provide a high-temperature operating
solid polymer composite electrolyte
membrane of excellent durability and low cost.
SOLUTION: Metal oxide hydrate as represented by a hydrate of tungsten
oxide or molybdenum oxide as a proton carrier and a heat-resistant
molecular film which chemically modifies an organic polymer or an organic
molecule and an inorganic molecule of nanometer level are conjugated to
form an electrolyte membrane, which gives birth to a **composite**
electrolyte membrane of an inorganic polymer and an organic polymer having
durability comparable to, or more than, that of a desired fluorine based
electrolyte membrane or practically enough durability and showing a
practical level of proton conductivity which has a substantially high
ion conductivity at high temperature range of around
160°C.
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L63 ANSWER 81 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 2002-100404 JAPIO
TI RESIN COMPOSITION FOR GEL HIGH **POLYMER SOLID**
ELECTROLYTE, COMPOSITION FOR THE GEL HIGH POLYMER
SOLID ELECTROLYTE, THE GEL HIGH POLYMER **SOLID**
ELECTROLYTE USING THEM, **COMPOSITE** ELECTRODE AND ELECTROCHEMICAL
DEVICE
IN SONOBE HIROYUKI; AMANOKURA HITOSHI; MIURA KATSUTO; TABUCHI MASAHITO;
NISHIMURA SHIN; OKUMURA SOUBUN
PA HITACHI CHEM CO LTD
DAISO CO LTD
HITACHI LTD

PI JP 2002100404 A 20020405 Heisei
AI JP 2000-286202 (JP2000286202 Heisei) 20000920
PRAI JP 2000-286202 20000920
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
IC ICM H01M010-40
ICS C08F290-14; C08F299-00; C08G065-04; C08K005-103; C08K005-3492; C08L071-02; H01B001-06; H01G009-038; H01G009-058; H01G009-035; H01M004-02; H01M006-18; H01M006-22
AB PROBLEM TO BE SOLVED: To provide a gel high polymer **solid** electrolyte having both superior **ion conductivity** and mechanical strength, and which is applicable to various electrochemical devices.
SOLUTION: This gel high polymer **solid** electrolyte contains (A) a polyether copolymer having an ethylene oxide denaturalized glycidyl ether compound and an ethylene oxide as main ingredients, (B) a polyether polymer which is a cross-linked product of a compound, having three or more ethylene unsaturated bonds in an element or a melamine compound having the ethylene unsaturated bond, and (C) an electrolyte.

L63 ANSWER 82 OF 82 JAPIO COPYRIGHT 2002 JPO
AN 2000-164224 JAPIO
TI ELECTRODE FOR FUEL CELL
IN SHINKAI HIROSHI; TANAKA ICHIRO; ONODERA MINAKO; IWASAKI KAZUHIKO; OBA TSUGIO; KATO HIDEO; BABA ICHIRO
PA HONDA MOTOR CO LTD
PI JP 2000164224 A 20000616 Heisei
AI JP 1998-339468 (JP10339468 Heisei) 19981130
PRAI JP 1998-339468 19981130
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
IC ICM H01M004-88
ICS H01M004-86; H01M008-02; H01M008-10
AB PROBLEM TO BE SOLVED: To enhance power generation by mixing platinum carrying carbon of an electrode catalyst, an alcohol solution of **solid polymer electrolyte membrane** component, and an organic solvent with a stirring apparatus having crushing effect, converting the carbon in high structured form with a three-dimensional vibration stirring apparatus, applying to a gas diffusion electrode **substrate** or a **solid polymer electrolyte membrane**, and removing the solvent to form a catalyst layer.
SOLUTION: Platinum carrying carbon with a specified ratio of platinum, an alcohol solution of an **ion conductive** component of a **solid polymer electrolyte membrane** component having a sulfone group which is a hydrogen ion exchange group, and an organic solvent are uniformly mixed with a planetary ball mill or a homogenizer to highly disperse them. By the next stirring with a three-dimensional vibration stirring apparatus, degree of aggregation association of structured carbon comprising many primary particles is increased, the viscosity of carbon paste is increased, and entering of the carbon paste into pores of porous carbon paper of a gas diffusion electrode **substrate** is made difficult. The utilization factor of the platinum catalyst is enhanced, and conductivity is increased. By heating in an inert gas atmosphere after coating, the solvent is removed.